Medical Library

MAR 16 1942

The ILLINOIS Medical Journal

VOL. 81 NO. 3

March, 1942

In This Issue

Abnormalities of Intrauterine Environment Associated With 2000 Fetal and Neonatal Deaths

✦

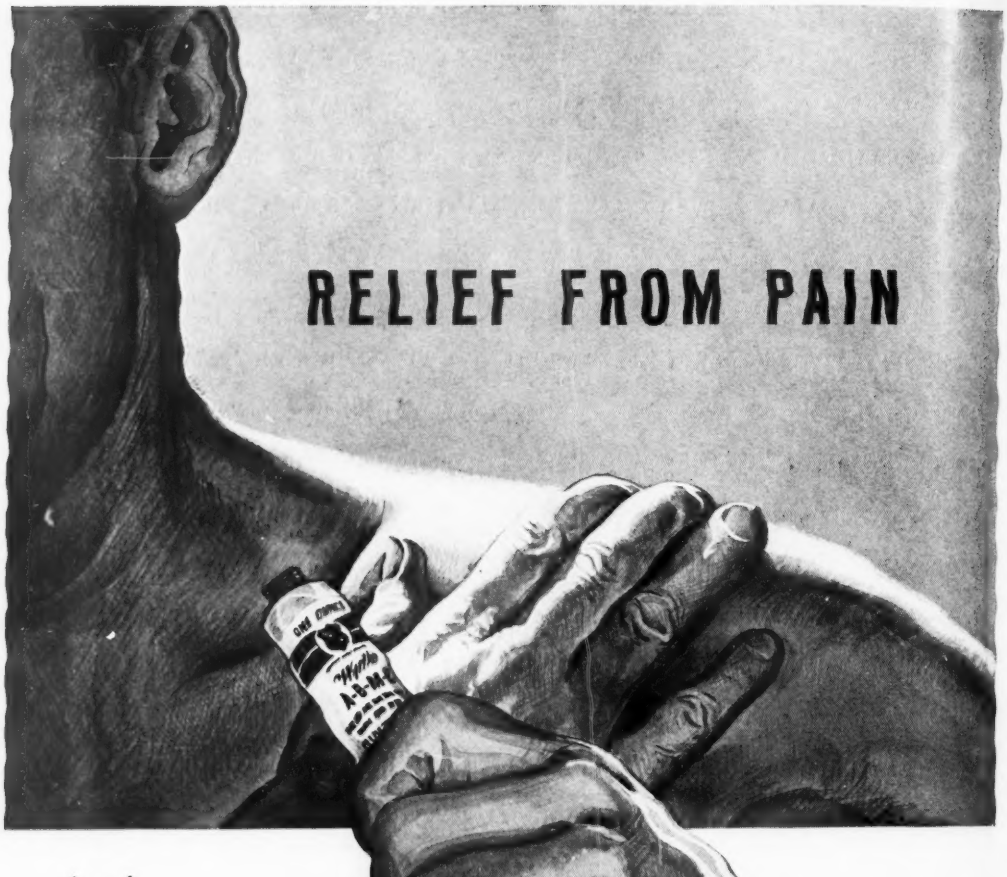
Management of Chronic Arthritis

✦

(See page 25 for Table of Contents)

ANNUAL MEETING ILLINOIS STATE MEDICAL SOCIETY SPRINGFIELD, MAY 19, 20, 21, 1942

OFFICIAL JOURNAL OF THE ILLINOIS STATE MEDICAL SOCIETY



. . . for the

ARTHRITIC PATIENT

A-B-M-C Ointment* relieves arthritic pain because of its local action in increasing the blood supply to the affected part by dilatation of the arterioles and capillaries.

In 88 percent of 96 patients studied, A-B-M-C Ointment provided relief from pain without any untoward effects when used as directed. No urticaria was produced in any case.†

A-B-M-C Ointment is spread, without rubbing, on the affected part and heat is applied for 20 minutes.

Supplied in 1-ounce tubes

†Archives of Physical Therapy, *21*, 12 (Jan.), 1940.

**A-B-M-C Ointment is a trademark of John Wyeth & Brother, Incorporated, for its brand of ointment containing Acetyl-β-Methylcholine Chloride 0.25%, menthol, thymol, eucalyptol and methyl salicylate in an emollient base.*

Wyeth's
A-B-M-C
OINTMENT

SAMPLES AND LITERATURE ON REQUEST

JOHN WYETH & BROTHER, INC., PHILADELPHIA, PA.

Entered as Second-class Matter July 21, 1919, at the Post Office, Oak Park, Illinois, under the Act of March 8, 1879. Acceptance for mailing at special rate of postage provided for in Section 1102, Act of October 8, 1917, authorized July 15, 1918. Office of Publication, 715 Lake Street, Oak Park, Ill.

The Illinois Medical Journal

March, 1942
VOL. 81, NO. 3

Official Journal of the Illinois State Medical Society

EDITOR — Harold M. Camp. EDITORIAL BOARD — James H. Hutton, Chairman, Frederick H. Falls, Josiah J. Moore, Edwin M. Miller, Chauncey C. Maher, Harry S. Gradle, Philip H. Kreuscher, Harry Culver.

Editorials

SELF MEDICATION

For a long time we have seen many serious and frequently disastrous results from self medication. Members of the medical profession realize that there are almost as many remedies for treating certain diseases as there are people who have had that particular disease. The last remedy used is usually considered the one which effected the cure, and the patient loses no time in telling his friends to be sure to use that same remedy if they have a cold, headache, stomachache, or whatever the ailment may have been.

There is no disease which causes so many layoffs on the part of American workers as the common cold, and everyone has a remedy for it. For those who seem uncertain as to what they should do, the radio will invariably give the answer. Almost any evening no less than a dozen broadcasts go out over the several networks, sponsored by concerns manufacturing preparations which will relieve colds "quickly and effectively." They urge the sufferer to take these preparations without delay, and invariably they insist that the taker need only follow the printed directions to get complete and quick relief.

Some of these remedies work several ways at the same time, and are to be taken orally; while others act through their alkalinizing ability, and through the laxative effect they produce. Others are to be rubbed on and go at once to the seat of the trouble, while some are to be inhaled to get quick relief. It is rather interesting that few of the broadcasts urge the sufferer to see his family doctor if relief from their remedies is not obtained.

The average drug store is well stocked with many different types of vitamin products and it becomes easy for the buyer to shop around and get the type which has been recommended, and frequently information on the proper types and dosage is freely forthcoming. In view of the fact that the professional ideas concerning vitamins and avitaminoses are changing rapidly and the final evaluation on the subject has not as yet been definitely determined, it seems that physicians and other health workers should stress particularly the necessity for all people to eat regularly and be certain their food contains the proper nutritional elements and vitamins for their daily needs. No one can deny that vitamins have a definite place in modern therapy, yet unless sufficient stress is placed on the other essential nutritional elements, the mere taking of A.B.C. and D. daily, will not meet the actual requirements.

Physicians know that many serious diseases begin with headache, digestive disturbances, backache, sore throat, nervousness and other symptoms which many believe can be cured through the use of various types of nostrums, especially if they are mentioned over the air or advertised in the papers. Warnings have been sent out repeatedly by health department officials urging people to seek proper advice from their physician rather than endeavor to get re-

lief through self medication. At this time, with the all-out program under way, it is more important than ever before that layoffs be limited to the greatest extent possible to keep our supplies coming off the lines and going in a steady stream to those places where they are needed most.

Then, there is another side of this subject which seems to be worthy of serious consideration right now. Many of these nostrums or "secret remedies" do contain vital drugs which should be conserved. With so many people taking them unnecessarily it is quite obvious that the supply available for civilian use will be used up more rapidly if they are used unnecessarily, which may eventually result in a rationing of drugs, some of which come from the far east and other distant lands, making them difficult to get in sufficient quantities now.

With an increasing army it is going to be necessary to have a vast supply of drugs available everywhere the army goes to be used as necessary by the medical officers attached to the many units. This too will be an important factor for priorities should naturally favor those who are to do the actual fighting to win this war.

It seems quite probable that within the near future, the government will give more serious consideration to this important subject, and we may see an organized effort to conserve all of the important drugs now being used in the field of medicine. When this is done we will probably see fewer people endeavoring to treat themselves especially for supposedly minor ailments. They will naturally do what is actually best for themselves at all times, consult their physician in times of illness, and what is really of greatest importance, they will probably consult him early!

HAVE YOU A HOBBY?

At many medical meetings during recent years a "hobby show" has been featured along with the scientific exhibits. It is most interesting to note the wide variety of hobbies of physicians as shown in these exhibits. Some physicians are painters, many are collectors of stamps, coins, Indian relics, minerals, and many other things found advertised widely in modern hobby magazines in recent years.

ILLINOIS STATE MEDICAL SOCIETY

GENERAL OFFICERS, 1941-1942

PRESIDENT.....CHARLES H. PHIFER, Chicago
PRESIDENT-ELECT.....E. H. WELD, Rockford
1ST VICE-PRESIDENT.....H. P. SAUNDERS, Chicago
2ND VICE-PRESIDENT.....FRED H. MULLER, Chicago
SECRETARY & TREAS.....HAROLD M. CAMP, Monmouth

THE COUNCIL

L. J. Hughes	1st	District, Elgin	1944
E. C. Cook	2nd	District, Mendota	1944
J. S. Nagel	3rd	District, Chicago	1943
L. E. Day	3rd	District, Chicago	1942
Percy E. Hopkins	3rd	District, Chicago	1944
E. P. Coleman	4th	District, Canton	1943
Ralph P. Peairs	5th	District, Normal	1943
T. B. Knox	6th	District, Quincy	1942
I. H. Neece	7th	District, Decatur	1943
C. E. Wilkinson	8th	District, Danville	1943
Andy Hall	9th	District, Mt. Vernon	1942
G. C. Otrich	10th	District, Belleville	1942
Edw. S. Hamilton	11th	District, Kankakee	1944
S. E. Munson	At	Large, Springfield	1942
J. S. Templeton	At	Large, Pinckneyville	1944
James H. Hutton	At	Large, Chicago	1943

Chairman of the Council.....E. S. Hamilton

EDITOR

Harold M. Camp.....Monmouth

GENERAL COUNSEL

Edward W. Rawlins.....77 West Washington St., Chicago

LEGISLATIVE COMMITTEE

Robert H. Hayes, Chairman....185 N. Wabash Ave., Chicago

MEDICO-LEGAL COMMITTEE

J. R. Ballinger, Chairman.....2724 W. North Ave., Chicago
T. B. Williamson, Secretary.....Mt. Vernon

EDUCATION COMMITTEE

R. R. Ferguson, Chairman..4013 N. Milwaukee Ave., Chicago
Miss Jean McArthur, Secretary.30 N. Michigan Ave., Chicago

PERMANENT HISTORIAN

Irving S. Cutter.....301 East Chicago Ave., Chicago

SCIENTIFIC SERVICE COMMITTEE

Robert S. Berghoff, Chairman..30 N. Michigan Ave., Chicago
Harold M. Camp, Secretary.....Monmouth

JOURNAL COMMITTEE

Percy E. Hopkins, Chairman ..... 800 W. 78th St., Chicago
Harry J. Stewart, Secretary.....715 Lake St., Oak Park

Outside of editorial or allied views or statements that are the authoritative actions of the Illinois State Medical Society, the organization denies responsibility for opinions and statements published in the ILLINOIS MEDICAL JOURNAL. Views expressed by the various authors and views set forth in various departments in the JOURNAL represent the views of the writers.

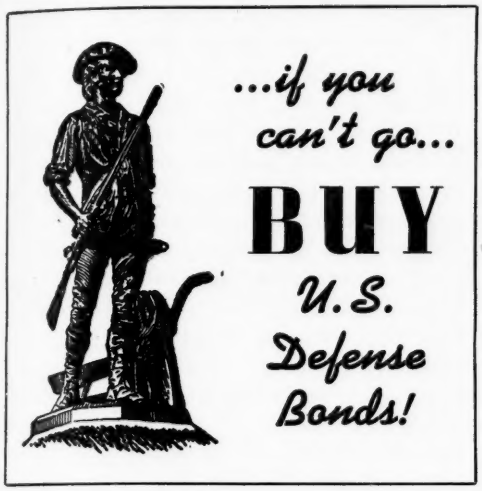
State Society will pay no bills for legal services except those contracted by the Committee. Notify the Chairman at once. Do not employ attorneys.

Send advertising copy, cuts and all communications relating to advertising to ILLINOIS MEDICAL JOURNAL, 30 N. Michigan Avenue, Chicago.

Original articles and membership correspondence to Dr. Harold M. Camp, Monmouth, Ill.

Society proceedings and news items and changes in the mailing list to Managing Editor, 30 N. Michigan Ave., Chicago.

Subscription price of this JOURNAL to persons not members of the Illinois State Medical Society is $3.00 per year, in advance, postage prepaid, for the United States, Cuba, Porto Rico, Philippine Islands, Hawaiian Islands and Mexico. $4.00 per year for all foreign countries included in the postal union. Canada, $3.50. Single current copies, 50 cents.



Many physicians have workshops in the basements of their homes, and spend time there at irregular intervals making many articles of furniture and other things too numerous to mention. It has been called to our attention that a number of physicians have electric trains running through miniature cities, over bridges, and through tunnels, with a display which has required hundreds of hours to complete it, then they say it is never really finished.

In the home, office or workshop of many physicians may be seen many mounted specimens of big game heads, fish, butterflies, birds, and other objects depending on the particular hobby of the man himself. Sporting goods proprietors report that the physicians are among their best customers, many members of the profession having a fine assortment of fishing tackle for both bait and fly casting technique. Some even spend many hours making their own flies and other lures.

In these troublesome days when everyone is continuously on the go, it seems most fitting that physicians should have hobbies and spend some time developing them throughout the year. It is known definitely that the physicians are probably subjected to more constant worry and strain than members of any other profession. It is quite obvious that many have lost the ability or perhaps the inclination, for complete relaxation which hobbies will afford. This may be an important factor in the prevailing high rate of heart ailments among physicians.

Coronary disease is a prominent factor in considerations of deaths among physicians, and it was recently shown that over a period of seven years, while there was a general increase of 114% in coronary deaths among men in general, the coronary mortality among physicians rose 240%. One striking thing in this consideration is the fact that this dreaded ailment is striking younger men, and it is not uncommon to find physicians in the third and fourth decades of life succumbing to coronary thrombosis.

There are, of course, many other factors involved in the cause of cardiac deaths among physicians, but it does seem quite logical to assume that physicians will be better off physically and most likely live longer if they will have some interests outside of the regular professional grind.

Many physicians are interested in farming, and there are some of the best farms in the state of Illinois owned and supervised by members of the medical profession. It is quite likely that among the members of the Farm Bureau in every county in Illinois will be found a few physicians who are interested in all phases of agriculture as well as in the raising of fine stock.

With the present all-out program for national defense, and the many additional duties assumed by physicians all anxious to do their part, we shall most likely see an increase in heart ailments among members of the profession unless each member becomes sufficiently heart conscious to warrant both an investigation of his own physical condition and the assuming of some outside interests to afford the much needed relaxation.

"HISTORY OF MEDICAL PRACTICE IN ILLINOIS"

A few years ago, the Illinois State Medical Society published the History of Medical Practice in Illinois, with the late Lucius H. Zeuch as editor for the volume. Subscriptions were received prior to the publication of this book, at $10.00. It was soon learned that it would be impossible to put all available historical data in one volume, and the Society decided that eventually a second volume would be published, and there would be no additional cost to subscribers.

Soon after the first volume appeared, Dr.

Zeuch died, and Dr. Charles J. Whalen, then editor of the Illinois Medical Journal was selected as editor for the proposed second volume. On account of unsatisfactory conditions, it was decided to hold the second volume in abeyance until some future date. Since the death of Dr. Whalen, it was deemed advisable to withhold further action on account of the present emergency.

The Society has on hand at this time, a number of copies of the first volume edited by Dr. Zeuch, which contains much valuable medical historical data, well illustrated, bound in cloth and in perfect condition, which may be procured while the supply lasts, for $5.00. Physicians or libraries desiring to procure a copy of this unusual book, may send their remittance to the Secretary, and a copy will be forthcoming, post paid within a few days.

Address: Harold M. Camp, M.D., Secy.
Illinois State Medical Society,
Monmouth, Illinois.

THE ORAL EXAMINATION OF PETER LA TERRIERE, HARVARD 1789

Describe the process of deglutition. What is the upper orifice of the stomach called? What conveys bile into the dodenum? How is the blood brought back from the lungs? How many lobes has the cerebrum? Of what is blood composed? What is inflammation? What is a pleurisy? Did you ever read Sydenham? What is bilious fever?

Questions such as these, and perhaps a good many more, were fired at Peter with machine gun rapidity, while the austere Dr. Isaac Rand, grimly determined that the Massachusetts Medical Society should have its hand in the proceedings, clocked the trembling victim and watched for signs of delay or hesitation in his answers. The last straw was the question of a rather pompous gentleman from the seats who wanted to know what was a sudorific and which was the most efficacious. This was too much for La Terrière's audacious temper; and anyone who has graduated from the Harvard Medical School or has suffered through oral examinations will feel like extending him a hand across the centuries. "A sudorific," Peter answered, "is anything that produces perspiration. The best way to make a man sweat that I know of is to make him stand up in a place like this on a hot afternoon and answer questions!"

An eighteenth century audience was never put out by a proper display of humor. They clapped their hands and shouted, "Well met! The candidate deserves his diploma."—*Reginald Fitz, Annals of Medical History, September,* 1941.

TREATMENT OF GONORRHEA WITH SULFATHIAZOLE

H. M. Boslow, Langley Field, Va., reports (*Military Surgeon,* June 1941) that fifty-three of fifty-eight cases of acute and chronic gonorrhea were cured, and the remaining five had positive cultures or morning discharge after two weeks' treatment but were improved clinically, by the following routine sulfathiazole treatment: On admission four to five Gm. were given followed by one Gm. every four hours for twenty-four hours. The dose was then reduced to 0.66 Gm. every four hours for forty-eight hours and then to 0.5 Gm. every four hours for ten to twelve days. The initial large dose was designed to avoid sulfathiazole resistant strains which have been shown to exist *in vitro* with related compounds. There were practically no toxic effects. One patient had a headache for twenty-four hours. One had conjunctivitis for three days and one had nausea and vomiting on the eleventh day of treatment. Therapy was discontinued in this case. Hemoglobin, white blood cell and red blood cell count were normal throughout treatment.

SAY SURGERY GIVES BEST RESULTS IN TREATING HIGH BLOOD PRESSURE

The outlook for patients with a high level of blood pressure (hypertension) and spasmodic contractions of the minute blood vessels of the eye is much more favorable following an operation in which certain nerves controlling the contraction and dilation of the blood vessels are severed than is the outlook following medical treatment, Ward Wilson Woods, M. D., and Max Minor Peet, M.D., Ann Arbor, Mich., report in *The Journal of the American Medical Association* for November 1.

"The surgical treatment of patients with malignant hypertension has resulted in a survival of 33 per cent after five years," the two surgeons add, "whereas following medical treatment . . . the mortality was more than 99 per cent."

Their findings are based on a comparison of the results of the nerve severance operation in 76 patients with those reported by two other physicians from medical treatment of 219 patients with the same condition. The surgical group were followed for from five to seven years after the operation and the medically treated group were followed from five to nine years. The discrepancy between the length of the two studies does not obviate relatively accurate comparison, the two surgeons say, because the time span of the medical group is calculated from the time of the first observation of the patient whereas in the surgical group it is calculated from the time of operation.

Correspondence

IOWA AND ILLINOIS CENTRAL DISTRICT SPRING MEETING

The spring meeting of the Iowa and Illinois Central District Medical Association will be held Thursday, March 26, 1942 at the Fort Armstrong Hotel in Rock Island, Illinois.

The guest speaker of the evening will be Dr. Robert Lee Sanders, associate professor of surgery at the University of Tennessee College of Medicine, and chief of the surgical division of the Sanders Clinic in Memphis, will speak on "Surgical Lesions of the Colon."

Dr. F. E. Schmidt of the Lederle Laboratories will present a motion picture in color with sound on "All Sulfonamide Therapy."

A dinner at 6:30 P. M. will precede the scientific meeting.

CONTRIBUTE TO BENEVOLENCE FUND

The following letter with a check for $100.00 to be added to the Benevolence Fund of the Illinois State Medical Society has been received. This is the first donation to the fund which has come from any group outside our Society or Auxiliary. The work of the Benevolence Committee has been growing during the past year and a half, and quite a number of beneficiaries are now receiving assistance.

Members of the Illinois State Medical Society, individual county medical societies and the Woman's Auxiliary should do everything possible to promote the giving of contributions to this fund, as this should eventually be a self-perpetuating fund to aid deserving, disabled members, and widows or widowers of former members.

The Society is most grateful to the Medinah Temple's Medical Staff for this donation, and they may be assured that the money is to be used by the Committee to a good advantage.

The Editor.

MEDINAH TEMPLE
A.A.O.N.M.S. Oasis of Chicago

Dr. John S. Nagel
Chicago, Illinois

Dear Dr. Nagel:

At the Annual Ladies Night Dinner of Medinah's Medical Staff it has always been customary to give each lady a personal gift.

The ladies this year, because of the war, were given an opportunity to vote a sum of money toward a benevolent fund.

They voted overwhelmingly that this sum be given to the Illinois State Medical Society benevolent fund. Enclosed find check for $100.00.

Respectfully
Dr. Fred H. Muller,
Secretary-Treasurer
8056 S. Justine St.,
Chicago, Illinois

ANNOUNCE PSYCHIATRIC POSTGRADUATE INSTITUTE

The Fifth Institute on Postgraduate Psychiatric Education will be held in the Missouri State Hospital at St. Joseph, Missouri from March 23 to April 4 according to an announcement of the American Psychiatric Association.

Designed for state hospital men and other physicians interested in psychiatry, it is open without charge. Physicians in military service are also invited.

A comprehensive course has been prepared. Sessions will be conducted by Dr. Carmichael, Dr. Watters, Dr. Reese, Dr. Hamilton, Dr. Weil and Dr. Tillman among others.

UNIVERSITY OF ILLINOIS

College of Medicine
Department of Obstetrics and Gynecology
Chicago, Illinois

The CHARLES SUMNER BACON LECTURES for 1941-1942 will be delivered in the Medical and Dental College Laboratories Building, 1853 West Polk Street, Chicago, in Room 423, on March 18 and 19, 1942

By

Dr. Jennings C. Litzenberg
Professor of Obstetrics and Gynecology,
Emeritus
University of Minnesota
College of Medicine
Minneapolis

PROGRAM

March 18, 1942, Wednesday, 1 P.M. —
"The Significance of the Decreased Maternal Mortality Rates."

March 19, 1942, Thursday, 4 P.M. —
"Tradition and Truth Concerning Ectopic Pregnancies."

WOMAN'S AUXILIARY TO THE ILLINOIS STATE MEDICAL SOCIETY

Haddon Hall will be the headquarters for the Annual Meeting of the Woman's Auxiliary to the American Medical Association, which will be held in Atlantic City, New Jersey, June 8-12, 1942.

COUNTY NEWS

The January meeting of the Auxiliary to the Bureau County Medical Society was well attended.

Mrs. T. S. Huggard of Oglesby, program chairman for the meeting, presented Mrs. R. E. Davies of Spring Valley. Mrs. Davies showed pictures taken while touring Guatemala and exhibited tapestries and other souvenirs collected during the tour.

Mrs. Christine Ryman Pensinger, supervisor of Institutional Housekeeping for the State of Illinois spoke at a joint meeting of the Vermilion County Medical Auxiliary and the American Association of University Women, Tuesday, Jan. 6th.

Taking as her subject "Housekeeping in the Institutions and the Place of the Homemaker in the War," Mrs. Pensinger touched on the many problems involved in keeping house for the 51,304 employees and patients in our state institutions.

In addition to her work in the department of welfare, the speaker is now cooperating with Gov. Dwight H. Green, as head of the Illinois State Council of Defense in planning a program to help housewives face the problem which the present war has created in the home.

Hostess at the dinner gathering was Miss Mary Miller, who was assisted by her own association committee and that of the Medical Auxiliary.

Miss Harriet Fulmer, R. N. Supervisor of Nurses for Cook County Health Unit spoke on "History of Rural Nursing Service in Cook County" at the February meeting of the Auxiliary to the Chicago Medical Society.

Mrs. Harry Otten, President
Mrs. Charles W. Stigman,
Press & Publicity

ANY PHYSICIAN MAY EXHIBIT "WHEN BOBBY GOES TO SCHOOL" TO THE PUBLIC

Under the rules laid down by the American Academy of Pediatrics, their new educational-to-the-public film "When Bobby Goes to School" may be exhibited to the public by any licensed physician in the United States.

All that is required is that he obtain the endorsement by any officer of his county medical society. Endorsement blanks for this purpose may be obtained on application to the distributor, Mead Johnson & Company, Evansville, Indiana.

Such endorsement, however, is not required for showings by licensed physicians to medical groups for the purpose of familiarizing them with the message of the film.

"When Bobby Goes to School" is a 16-mm. sound film, free from advertising, dealing with the health appraisal of the school child, and may be borrowed by physicians without charge or obligation on application to the distributor, Mead Johnson & Company, Evansville, Indiana.

Reducing exercise: Move the head slowly from side to side when asked to have a second helping.

Medical Economics

Edited by R. K. Packard, M.D., Chairman of the Committee on Medical Economics of the Illinois State Medical Society, 826 East 61st Street, Chicago, Illinois.

As a result of the war new problems arise that have patriotic, ethical and economic bearings on the profession as a whole.

First: We as a profession consider it our patriotic duty to render such medical service as is needed in the various branches of the Military Service and to our civilian population. Some will render that service in one of the branches of the service as Commissioned Officers, and still others will remain at home and take care of the civilian population and render whatever service they are called upon to do to the best of their ability.

This entire problem as regards service is to be handled through the Procurement and Assignment Service for Physicians, Dentists and Veterinarians. This service is a result of the efforts of the American Medical Association and its Officers and Committees, and should provide a much better type of service than was rendered in the last World War. To make it effective and to insure the continuance of this method the medical profession must respond to the questionnaires that will again soon be mailed out covering the entire service.

Second: Those who enter the service and leave their practice and their affiliations with medical schools, hospitals and clinics will to a large extent do so at a financial loss; and those who remain in practice will undoubtedly have an increased revenue as a result of increased work. It is true that a large part of that increased revenue will be paid to Uncle Sam in the form of income tax and other taxes, but it will probably still leave an increased revenue; aside from this they will not loose their practice. Those remaining at home should assume a definite responsibility to maintain and restore former affiliations to those in the service immediately upon their return to private practice. In addition they should do everything within their power to return patients to the doctors who have been in the service. This happened in some instances after the last World War, but in some instances quite the opposite took place. In addition the young doctors going direct from the completion of their internship to the service are undoubtedly due consideration when they return from the service.

Thought must be given to these problems far in advance if they are to be properly taken care of, and most of all those who remain at home must give serious consideration to maintaining our present system of medical practice during the war. It is natural that with Civilian Defense and with some dislocation in industry as regards medical service that there may of necessity have to be temporary changes made, but we should be very sure that these changes are really for defense, and that defense is not used as an excuse for making such changes or inroads in the present system of medical practice. Unless we can maintain the present system we have little to offer those who are returning for the sacrifices and losses that their services will necessarily bring to them.

Third: Many doctors entering the service will not return and undoubtedly their families will not be in sufficiently good financial circumstances to carry on. In addition among the older doctors we may find many breakdowns in health due to over work which will necessitate their retirement. Many of them will not have a sufficient income to carry on. The Illinois State Medical Society organized a Benevolence Fund some two years ago for the benefit of doc-

tors and their widows who were in need of financial help. It would seem at the present time that every physician at home might contribute to this Benevolence Fund so that we will be sure that families of doctors who do not return from the service may, where needed, have this help and also that doctors becoming physically handicapped may have such help where needed. Many of us make contributions to various charity organizations to enable them to carry on their work. Here we have an opportunity to render help to those physicians who have devoted their lives to the profession and the public. Those familiar with the work of the Benevolence Fund Committee are impressed with the excellent work and the vital need for such a fund. The members of the committee give a great deal of their time to this work. Let us support this work that is being done for the members of our profession. This contribution is deductible from your income tax.

The Woman's Auxiliary in the past year have been doing creditable work in their contributions to the Benevolence Fund and it would seem at this particular time that they should continue, even to a greater extent, to carry on this work.

Dr. R. K. Packard, Chairman
Committee on Medical Economics

THE PHARMALOGICAL SHOCK TREATMENT OF SCHIZOPHRENIA

Considerable number of patients have now been treated by so-called "shock therapy," so that a statistical study although faulty will present certain evidence as related to this form of therapy. This study consisted of treated cases and untreated cases which were used as a control group. It is apparent from this study that the number of recovered cases as well as the total number showing some degree of improvement was about three times that in the control group receiving the usual institutional care.

When all types of schizophrenia are considered there is a recovered rate which stays constant at about 13%. The range of percentage cases with complete remissions varies from 85% to below 5% and is dependent on the type of disease and its duration, these factors giving the wide variation in per cent of those recovered. All statistical studies are difficult to evaluate because of the numerous variables, namely, difficulty of diagnosis, records which lack uniformity, incomplete history, duration of disease, in that the more chronic the disease the longer its existence, the more difficult it is to bring about a remission. Then, too, recovery rate must be ascertained by a follow-up program for quite an extended period. Some patients after treatment show increased improvement for a period of two-years, on the other hand, others during the same period will have a relapse.—*J. R. Ross, M.D., I. M. Rossman, M.D., W. B. Cline, Jr., M.D., O. J. Schwoerer, M.D., American Journal of Psychiatry, March,* 97: 1007-1023, 1941.

NEURODERMATITIS TREATED WITH HYPOGLYCEMIC REACTIONS

The group of dermatoses variously considered under the names neurodermatitis, atopic dermatitis and generalized or disseminated neurodermatitis are among the most resistant therapeutic problems in dermatologic practice. Many remedies have been tried with more or less success.

With any method, treatment lasts for months, even years; yet some patients recover without any special treatment. Most of the patients with the severe conditions require psychiatric attention — perhaps all do — because of an underlying depression and emotional tension.

Our interest in the neurodermatoses was aroused by the development of a stubborn dermatitis in 2 depressed patients. Since the frequent good effects of insulin shock therapy on the skin were known, these patients were given short courses of mild hypoglycemic shocks. The gratifying results led to the treatment of 3 additional patients. All primarily suffered from emotional tension and depression.

Repeated hypoglycemic shocks, reactions sufficient to produce visible effects, particularly relaxation and diaphoresis, constituted the only factor to cure or to relieve the symptoms of the cutaneous disturbances. Treatment in all cases was successful.—*Sidney J. Tillim, M.D. and Mildred T. Squires, M.D., Archives of Dermatology and Syphilology, June,* 43: 980-991, 1941.

Doctor: "Miss Jones, you're badly in need of a little sun and air."

Miss Jones: "But hadn't I better get married first?"

Medicine and National Defense

PROCUREMENT AND ASSIGNMENT SERVICE FOR PHYSICIANS, DENTISTS AND VETERINARIANS

This material taken from the Medical Preparedness Section of the Journal of the American Medical Ass'n., 2/21/42. More complete information on the subject is contained in this article, pages 625-638 of the J.A.M.A.—Editor.

HISTORY

The Procurement and Assignment Service was authorized by the President on Oct. 30, 1941. The creation of this agency resulted from a recommendation from the Subcommittee on Education to the Health and Medical Committee of the Office of Defense, Health and Welfare Services on March 31, 1941. Following a meeting of the Health and Medical Committee on April 28, this recommendation was transmitted to the Committee on Medical Preparedness of the American Medical Association for its consideration. The latter committee presented the recommendation to the House of Delegates of the American Medical Association, which resolved:

That the United States government be urged to plan and arrange immediately for the establishment of a central authority with representatives of the civilian medical profession to be known as the Procurement and Assignment Agency for physicians for the Army, Navy and Public Health Service and for the civilian and industrial needs of the nation.

On Oct. 22, 1941 the Health and Medical Committee named a commission to draft a plan for development of such a service. As a result of the meeting of this commission, it was recommended that an office for procurement and assignment of physicians, dentists and veterinarians should be established, that the office should be a part of the Office of Defense Health and Welfare Services and that the function of the office should be to procure personnel from existing qualified members of the professions concerned. The Procurement and Assignment Services, through the facilities of the Office of Defense, Health and Welfare Services, would have available the fiscal budgetary, legal and advisory departments of a well established governmental agency. The concluding paragraphs of its report are as follows:

For this reason a special commission, appointed by the Health and Medical Committee of the Office of Defense Health and Welfare Services has made the following recommendations:

1. That an Office of Procurement and Assignment of physicians, dentists and veterinarians be established.

2. That this office shall function as part of the Office of Defense, Health and Welfare Services, which is itself a part of the Office for Emergency Management.

3. The function of this office shall be to procure personnel from existing qualified members of the professions concerned. The office shall receive from various governmental and other agencies requests for medical, dental and veterinary personnel. These requests shall indicate the number of men desired, the time during which they must be secured, the qualifications and limitations placed on such personnel. The office must then by appropriate mechanism arrange to secure lists of professional personnel available to meet these requirements, utilizing such existing rosters, public and private, as it may find acceptable. It shall also be authorized to approach such professional personnel as is

considered to be available and to use suitable means to stimulate voluntary enrolment.

4. The Office of Procurement and Assignment shall consist of a board of five members, one of whom shall be chairman. This board shall be chosen from members of the medical, dental or veterinary professions and shall not include any salaried employees of the federal government. This board shall function without salary but shall be entitled to actual and necessary transportation, subsistence and other expenses incidental to the performance of its duties.

5. The board shall appoint an executive secretary who shall serve also as executive officer and who shall be without vote in its deliberations and decisions. He shall serve as a full time employee with salary (to be determined) and with such assistants as the board may determine necessary to carry out its functions.

6. The board shall be authorized to establish such advisory committees and subcommittees as may be necessary. These committees shall represent the various interests concerned, such as medical, dental and veterinary schools, hospitals, Negro physicians and women physicians. Members of such committees shall serve without salary but shall be entitled to actual and necessary transportation, subsistence and other expenses incidental to the performance of their duties.

7. The board shall also be authorized to request various agencies of the government using medical, dental or veterinary personnel to appoint liaison officers and representatives to advise the board in carrying out its functions.

8. In carrying out its functions the board shall cooperate with such agencies as are now established under the Selective Service as well as other federal agencies.

On October 30, 1941 the following letter to the President from the Director of Defense Health and Welfare Services was approved by the President and constitutes the authority under which the Procurement and Assignment Service operates:

October 30, 1941

My Dear Mr. President:

The coordination of the various demands made on the medical, dental and veterinary personnel of the nation and the most efficient utilization of this personnel would seem to require the establishment of a special agency capable of recording the qualified personnel available, of assigning or encouraging enlistment of such personnel in the services where most needed and of giving every qualified physician, dentist and veterinarian an opportunity to enroll himself in some service demanded by the national need.

For these reasons I wish to propose that there be established as one of the principal subdivisions of the Office of Defense Health and Welfare Services an office for the procurement and assignment of physicians, dentists and veterinarians. This office would be known as the Procurement and Assignment Agency.

The functions of the agency would be (1) to receive from various governmental and other agencies requests for medical, dental and veterinary personnel, (2) to secure and maintain lists of professional personnel available, showing detailed qualifications of such personnel, and (3) to utilize all suitable means to stimulate voluntary enrolment, having due regard for the overall public health needs of the nation, including those of governmental agencies and civilian institutions.

The agency would consist of a board of five members, one of whom would serve as chairman. The board would serve without salary but would be entitled to actual and necessary transportation, subsistence and other expenses incidental to the performance of its duties.

A full time executive officer (with salary to be determined) would be appointed, together with such assistants as would be required to carry out the functions of the Agency.

I recommend that the board be composed of Dr. Frank Lahey, chairman, Dr. James Paullin, Dr. Harvey B. Stone, Dr. Harold S. Diehl and Dr. C. Willard Camalier.

This communication is addressed to you in accordance with provisions contained in paragraph 4 of the Executive Order, dated Sept. 3, 1941, "Establishing the Office of Defense Health and Welfare Services in the Executive Office of the President and Defining Its Functions and Duties," to the effect that the President shall approve the establishment of the principal subdivisions of the Office of Defense Health and Welfare Services and the appointment of the heads thereof.

In the event you approve the establishment of the Procurement and Assignment Agency, together with the board membership as recommended, I shall proceed immediately with the creation of the agency and will prepare budget estimates in the amount of approximately $50,000 for submission to the Budget Bureau to cover the costs of the agency.

In addition I would propose to instruct the Agency to draft legislation which may be necessary to submit to the Congress providing for the involuntary recruitment of medical, dental and veterinary personnel, in the event the exigencies of the national emergency appear to require it.

Sincerely yours,

Approved Paul V. McNutt,
Franklin D. Roosevelt. Director.

This letter was approved by the President, Oct. 30, 1941, and the Procurement and Assignment Service was organized accordingly.

PROCEDURE TO MEET PRESENT NEEDS

The present Army and Navy needs are for physicians under 36 years of age. Those under 36 desiring immediate commission may write now to the Procurement and Assignment Service, 601 Pennsylvania Avenue N.W., Washington, D. C. Their letters will be treated as applications and those who are qualified will receive proper application forms with view of commission in the Army or the Navy. All physicians over 36 and all dentists and veterinarians should await the receipt of the enrolment forms.

METHODS OF ACTION OF THE PROCUREMENT AND ASSIGNMENT SERVICE

By authority of the President, the Procurement and Assignment Service receives requests for personnel from the following governmental agencies:

MEDICAL

United States Army Medical Corps.
United States Navy Medical Corps.
United States Public Health Service.
United States Veterans Administration.
United States Civil Service Agencies.
St. Elizabeth's Hospital (Washington, D. C.), Resident Staff and Interns only.
United States Indian Service,
Panama Canal Service.
Office of Civilian Defense (full time).

DENTAL

United States Army Dental Corps.
United States Navy Dental Corps.
United States Public Health Service.
United States Veterans Administration.
United States Indian Service.
Panama Canal Service.
Office of Civilian Defense.

VETERINARY

United States Army Veterinary Corps.
United States Navy Hospital Corps Specialists.
United States Public Health Service.
United States Bureau of Animal Industry.
Federal Extension Service.
State Extension Service.
United States Department of Agriculture Marketing Service.
War Department (Federal Civil Service Status — not Army).
Federal Agricultural Experiment Stations.

The Procurement and Assignment Service is also charged with the stimulation of voluntary enrolment, having due regard for the overall health needs of the nation, including the personnel of civilian institutions.

When a request is received from a federal agency for medical, dental or veterinary personnel, the names of those who are qualified to meet the specifications established by the requisitioning agency, who are available and who have indicated by enrolling with the Procurement and Assignment Service, their willingness to apply for a commission or employment are supplied by the National Roster, utilizing the punch card system previously described. These names are arranged in lists by states. A copy of each list is forwarded to the Consultant Office of physicians, dentists or veterinarians respectively, where each is made more accurate by the elimination of the names of those who do not qualify in view of the special information held in the Consultant Office. These lists are then referred to the state chairman, who make a decision as to the immediate availability of the physicians, dentists or veterinarians concerned. Such a step is necessary because the availability of the individual may have changed in the period between the return of the official questionnaire in March

1942 and the time when the physician, dentist or veterinarian is notified of the need for his services. The lists are then forwarded by the state chairmen to the Procurement and Assignment Service in Washington.

From these lists the central office obtains the names of those individuals who have thus been found qualified and available.

PHYSICIANS, DENTISTS OR VETERINARIANS FOR THE UNITED STATES ARMY MEDICAL DEPARTMENT

The procedure with reference to supplying personnel to the United States Army Medical Department is governed by the following letter of instruction sent out by the Adjutant General's Office to all corps area and department commanders on Jan. 21, 1942:

WAR DEPARTMENT
The Adjutant General's Office
Washington

January 21, 1942

Subject: Procurement of Officers for Medical Department, Army of the United States.

To: All Corps Area and Department Commanders.

1. Letter from this office dated Feb. 3, 1941, file AG381 (8-13-40) R-A, Subject: "Assistance of the American Medical Association in the classification and procurement of physicians for military service," is rescinded.

2. There has been established under the Office for Emergency Management, Office of Defense Health and Welfare Services, a Procurement and Assignment Service to coordinate the procurement of physicians, dentists and veterinarians for all governmental, industrial and civilian requirements.

3. In order to expedite appointments in the Medical Corps, Dental Corps and Veterinary Corps, Army of the United States, the following procedure will govern the processing of all applications:

(*a*) All individual inquiries for information concerning a commission or offers to serve as a medical, dental or veterinary officer should be acknowledged by the headquarters receiving the communication and the communication itself forwarded by indorsement to the Executive Officer, Procurement and Assignment Service, Office of Defense Health and Welfare Services, Social Security Building, Washington, D. C.

(*b*) The Procurement and Assignment Service will supply to individual applicants who are eligible and qualified for appointment the required forms (WD AGO Form No. 170, "Application for Appointment and Statement of preferences for Reserve Officers," in duplicate, and WD AGO Form No. 178 and 178-2, both in duplicate) together with a request on the surgeon of the nearest Army post for a final type physical examination. Each request for final types physical examination authorized by the Procurement and Assignment Service will be honored by surgeons of Army posts. Application forms and supporting papers, except the report of physical examination, will be returned by the applicant to the Procurement and Assignment Service; the report of physical examination (WD AGO Form No. 63) will be forwarded by the surgeon of the station at which the examination was conducted, direct to the Surgeon General.

(*c*) The completed applications and supporting papers, except report of physical examination, will be transmitted by the Procurement and Assignment Service to the Surgeon General together with a statement by that service derived from its files and regarding eligibility of the applicant for appointment in the Medical, Dental and Veterinary Corps, Army of the United States, as prescribed by current Army regulations. The Procurement and Assignment Service will also furnish the Surgeon General with the professional classification and evaluation of the applicant as determined from the recent nationwide survey made by the Committee on Medical Preparedness of the American Medical Association.

(*d*) The Surgeon General will forward such completed applications to the Adjutant General as prescribed in paragraph 10 (4), Army Regulations No. 605-10, and inform the Procurement and Assignment Service of action recommended.

4. No change in the present procedure for the appointment of graduates of medical units of the Reserve Officers' Training Corps in the Medical Corps Reserve or for appointment in the Army of the United States of physicians and dentists for affiliated units, of junior and senior students in medical schools in the Medical Administrative Corps, Army of the United States, or of graduates of such schools who are to be appointed in

the Medical Corps, Army of the United States, on graduation.

5. When the applications for appointment have been approved the Adjutant General will notify the applicant direct of his appointment with instructions as to proper completion of oath of office and finger print card and the return of such forms direct to the Adjutant General. When the oath of office has been received by the Adjutant General, the Surgeon General and the Executive Officer, Procurement and Assignment Service of the Office of Defense Health and Welfare Service, Office for Emergency Management, Washington, D. C., will be notified.

By order of the Secretary of War.

(Note: Address now 601 Pennsylvania Avenue N.W., Washington, D. C.)

In summary, the procedure is as follows:

1. The Surgeon General requisitions needed personnel from the Central Office of the Procurement and Assignment Service.

2. The National Roster prepares an appropriate list of names from the National Roster of Scientific and Specialized Personnel.

3. The National Roster sets aside the cards from the file of those available.

4. This list is forwarded to the Consultant Office, Procurement and Assignment Service.

5. The Consultant Office forwards the names to the chairmen of relevant state committees of the Producement and Assignment Service.

6. These chairmen forward to the central office the lists they received, with names of unavailable (essential) persons indicated.

7. The Central Office mails application forms and authority for physical examination to the qualified and available proposed applicants.

8. Each applicant applies for "final type" physical examination at the nearest Army post.

9. The examiner sends the report to the Surgeon General's Office.

10. The applicant returns his completed application blank and supporting papers direct to the Central Office of the Procurement and Assignment Service.

11. The central office forwards the application form and the supporting papers direct to the Surgeon General.

12. The Surgeon General's Office joins the completed application blank, supporting papers and the corresponding report of physical examination.

13. The Surgeon General's Office determines whether or not to recommend the applicant to the Adjutant General on the basis of physical and professional qualifications.

14. The Adjutant General notifies the applicant that he has or has not been appointed.

15. The Central Office of the Procurement and Assignment Service is notified whether the applicant has been, or has not been, appointed.

16. The names of those not commissioned are again placed in the file of the National Roster so that the persons affected may be available for other service.

Note.—After the applicant has sent his application form and supporting papers to the Central Office of the Procurement and Assignment Service, he may expect his further correspondence to be carried on with the Surgeon General's Office or the Adjutant General's Office.

PROVISION OF PHYSICIANS AND DENTISTS FOR THE UNITED STATES NAVY MEDICAL AND DENTAL CORPS

When a request is received from the United States Navy Medical or Dental Corps for personnel, the same procedure will be followed in securing lists of names as has already been described in the previous section regarding the provision of personnel for the Army. The lists of names received from the state chairman will then be forwarded by the Procurement and Assignment Service to the Bureau of Medicine and Surgery, Navy Department, Washington, D. C. The Bureau of Medicine and Surgery will then conduct negotiations with the physicians and dentists concerned through the commandants of their respective naval districts. Should a physician or dentist apply directly to a naval commandant for commission in the United States Naval Medical or Dental Corps, the procedure outlined in the following letter from the Bureau of Medicine and Surgery to the commandants of all naval districts, dated Feb. 3, 1942, prevails:

February 3, 1942.

From: The Chief of the Bureau of Medicine and Surgery.

To: The Commandant, All Naval Districts.

Subject: Status of Procurement and Assignment

Service for Physicians, Dentists and Veterinarians in connection with recruitment of medical and dental officers for the U. S. Naval Reserve.

1. The Secretary of the Navy has approved the recommendations of the Chief of the Bureau of Medicine and Surgery whereby the services of the "Procurement and Assignment Service, of the Defense Health and Welfare Services," an organization recently created by the President, may be utilized by the Navy in facilitating the recruitment of medical and dental officers for the U. S. Naval Reserve.

2. The primary function of the above mentioned service as pertains to the Navy is to furnish information which indicates certain applicants for appointment in the Medical and Dental Corps of the Naval Reserve either do or do not occupy positions in civil life which are considered essential to the national defense, to the proper functioning of medical and dental schools or whose acceptance of appointments in the Naval Reserve would jeopardize the health and welfare of a local community, such as removing the only qualified orthopedic surgeon from a community composed practically entirely of miners or workers in a factory producing materials essential to the government.

The furnishing of such information to the commandants, before investigation of an applicant, would be of distinct advantage in that the number of investigations would be materially reduced and, in the case of applicants considered essential or holding civilian appointments connected with national defense, need not be accomplished.

3. In this connection, the following procedure is suggested with the request that it be executed by the District Medical Officer on all applications received after Feb. 16, 1942:

(*a*) Whenever a physician or dentist makes application for appointment, four copies of the enclosed form are to be immediately filled out and the original and two copies forwarded to the Bureau of Medicine and Surgery. It is desired these forms be forwarded when the first contact is made in any given case, without waiting for the applicant to return his completed application.

(*b*) The Bureau of Medicine and Surgery will retain one copy and send the original and one copy to the Executive Secretary of the Procurement and Assignment Service.

(*c*) When the Executive Secretary of the Procurement and Assignment Service has placed his endorsement thereon, he will return both copies to the commandant concerned.

(*d*) If the candidate is not cleared, both copies should be forwarded by the commandant to the Bureau of Medicine and Surgery and the candidate informed by the commandant his application cannot be accepted in view of the action of the Procurement and Assignment Service. The Bureau of Medicine and Surgery will make the second endorsement, retain the original and forward the copy to the Executive Officer of the Procurement and Assignment Service.

(*e*) If the candidate is cleared, both the original and the copy of the form should be forwarded to the Bureau of Navigation with the application. After final action is taken the Bureau of Medicine and Surgery will make the second endorsement, retain the original and forward the copy to the Executive Officer of the Procurement and Assignment Service.

(*f*) About fifty copies of the form adaptable for this purpose are enclosed to serve as a sample of others to be mimeographed or printed locally.

Ross T. McIntire.

In summary, the procedures for Navy procurement are as follows:

1. The Bureau of Medicine and Surgery requisitions personnel from the central office of the Procurement and Assignment Service.

2. An appropriate list of names is prepared from the National Roster of Scientific and Specialized Personnel.

3. The National Roster sets aside the cards bearing these names from the file of those available.

4. The list is forwarded to the Consultant Office, Procurement and Assignment Service.

5. The Consultant Office forwards the names to the chairmen of relevant state committees of the Procurement and Assignment Service.

6. These chairmen forward to the central office the lists they received, with names of unavailable (essential) persons indicated.

7. The central office forwards the names of qualified and available persons to the Bureau of Medicine and Surgery.

8. The Bureau of Medicine and Surgery conducts the subsequent negotiations with the proposed applicants.

9. The Bureau of Medicine and Surgery notifies the central office of the Procurement and Assignment Service which applicants have been and which have not been appointed.

10. The names of those not commissioned are again placed in the file of the National Roster, so that the persons affected may be available for other services.

When an applicant applies directly to any Army installation for commission in the Army Medical or Dental or Veterinary Corps, he is referred to the Procurement and Assignment Service. When an applicant applies to any Naval Commandant for commission in the U. S. Medical or Dental Corps, his application is sent to the Bureau of Medicine and Surgery and such names are cleared through the Procurement and Assignment Service before the commissions are granted.

UNITED STATES PUBLIC HEALTH SERVICE

The Surgeon General of the United States Public Health Service has issued the following circular to all District Directors and Medical Officers in Charge concerning new appointment procedure for physicians and dentists:

February 14, 1942.

1. The Procurement and Assignment Service within the Office of Defense Health and Welfare Services has the responsibility for assisting in the procurement and assignment of physicians and dentists in such manner as to best serve the over-all health and medical needs of the country. It is essential that the personnel policy of the Public Health Service be consistent with the major purposes of the Procurement and Assignment Service.

2. It is desired that applications be solicited from qualified physicians and dentists for commission in the reserve corps of the U. S. Public Health Service. The expansion of the reserve corps of the Public Health Service is necessary to serve two major purposes:

(*a*) The creation of a pool of qualified public health personnel to safeguard essential civilian health services and at the same time to be available for immediate, though temporary, active duty in the event of some major public health emergency.

(*b*) The procurement of sufficient numbers of qualified physicians and dentists to enable the Public Health Service to carry on its normal and war-time activities.

3. In order to serve these two major purposes, it will be necessary to recruit into the reserve of the Public Health Service physicians and dentists who come within the two following categories:

(*a*) Those who are now engaged in public health work and who by reason of special training and experience occupy strategic positions in their present civilian capacities. Such personnel would be expected to remain on inactive status with the Public Health Service, except in the event of a major disaster, in which case they would be subject to immediate, though temporary, active duty.

(*b*) Those who are professionally qualified and also available for immediate active duty in the Public Health Service for such periods of time as the exigencies of the service may determine.

4. Applications from physicians and dentists relating to commissions in the reserve of the Public Health Service will be processed in the following manner: On receipt of an application by the office of the Surgeon General, the application forms and all supporting papers, including the report of physical examination, will be transmitted with a definite recommendation of the Surgeon General to the Procurement and Assignment Service. The Procurement and Assignment Service will in turn certify to the Surgeon General as to the availability of the individual for appointment. In the case of public health personnel occupying strategic positions in civilian posts, the criterion of availability for commission would rest largely upon the fact that the individual occupies a strategic position, and therefore should remain as long as practicable on an inactive status. In the case of personnel to be called to immediate active duty, the criterion of availability would be based upon the ability of the community to spare the services of the individual. Upon receipt from the Procurement and Assignment Service of notice of clearance, indicating that the applicant is available for a commission in the reserve of the Public Health Service, the appointment will be completed in the usual manner.

5. The above procedure does not apply to the recruiting of individuals for the regular corps of the Public Health Service, or to the appointment of interns or doctors certified by the Civil Service Commission, or to the appointment of sanitary engineer officers in the reserve.

6. When the Public Health Service is without acceptable applications from physicians and dentists for filling vacancies, the Surgeon General will request the Procurement and Assignment Service for the names and qualifications of persons available to fill such vacancies. When decision has been reached as to the selection or non-selection of such persons, the Surgeon General will advise the Procurement and Assignment Service.

7. The Procurement and Assignment Service has given its endorsement to the procedure outlined above.

Thomas Parran,
Surgeon General.

Approved:
Paul V. McNutt,
Administrator.

On January 28, 1942, the following memorandum (1-363) was released by the Director of Selective Service to all state directors of the Selective Service System.

OCCUPATIONAL DEFERMENTS OF MEDICAL DOCTORS, DENTISTS AND DOCTORS OF VETERINARY MEDICINE

Information previously distributed by this headquarters clearly indicates an overall shortage of medical doctors, dentists and doctors of veterinary medicine in the nation. Since war was declared, the shortage of these professional men has become acute. It is now manifest that every qualified doctor, dentist and veterinarian must serve where he can render the greatest professional service to the nation.

In order to accomplish this purpose, the President, by Executive Order, has formed the Procurement and Assignment Service, under the Office of Defense Health and Welfare Services. This Service was formed primarily for the purpose of gathering and making available information with respect to the supply of qualified practitioners in the field of medicine, dentistry and veterinary medicine, with a view of securing the most effective allocation of medical manpower as indicated by the requirements of the armed forces, civilian needs and industrial medicine.

To work with the headquarters of this Service in Washington, there is being organized a committee for each Corps Area in the Continental United States. Each committee will consist of five doctors, two dentists and one veterinarian. The committees have been accepted as advisers to the nine Corps Area Surgeons, to the Naval District Surgeons and to the Regional Medical Officers of the Office of Civilian Defense and will operate not only through the subdivisions of the medical, dental and veterinary association but also with the profession at large in securing information and giving advice.

When considering the classification of any registrant who is a qualified medical doctor, dentist, or doctor of veterinary medicine, the Director of Selective Service desires that local boards, through the State Director, shall consult the Procurement and Assignment Committee of the Corps Area for information as to the availability of qualified medical doctors, dentists and doctors of veterinary medicine in the community. This information shall be considered by the local board in determining the registrant's classification. The Executive Order referred to in no way affects the authority of the Selective Service System to classify registrants. The procedure has been established for the purpose of making such information available to local boards.

For the convenience of the State Director and the local boards, the names and addresses of the Chairmen of the Nine Corps area committees of the Procurement and Assignment Service are listed:

First Corps Area: Dr. W. G. Phippen, Salem, Mass.

Second Corps Area: Dr. A. W. Booth, Elmira, N. Y.

Third Corps Area: Dr. A. M. Shipley, Baltimore, Md.

Fourth Corps Area: Dr. Edgar Greene, Atlanta, Ga.

Fifth Corps Area: Dr. E. L. Henderson, Louisville, Ky.

Sixth Corps Area: Dr. Charles H. Phifer, Chicago, Ill.

Seventh Corps Area: Dr. Roy W. Fouts, Omaha, Neb.

Eighth Corps Area: Dr. Sam E. Thompson, Kerrville, Texas.

Ninth Corps Area: Dr. Charles A. Dukes, Oakland, Calif.

Lewis B. Hershey, Director

DEFERMENTS FOR STUDENTS

The Secretary of the Navy recently approved a change in Navy regulations whereby it is now possible for persons who have been accepted for entrance in the next entering class and all medical students in class A medical colleges and approved dental colleges to be appointed in the United States Naval Reserve with the commission Ensign H-V (P), provided they meet the physical and other requirements for such appointment. It should be noted that this applies not only for persons holding letters of acceptance and freshmen and sophomore students in these medical and dental schools but also juniors and seniors.

The Secretary of War has recently approved a change in Army Regulations which authorizes the commission as Second Lieutenant, Medical Administrative Corps, Army of the United States, of all students in class A medical colleges and to those persons who have matriculated in these colleges, providing they meet the physical and other requirements for such appointment. It should be noted that this opportunity includes freshmen and sophomores as well as juniors and seniors.

For commission in the Navy, application forms may be obtained from the dean's office or from some one designated by him, or from the commandant of the naval district in which the applicant resides. Further information may be obtained from the office of the commandant of any naval district.

For commission in the Army, applications should be made through the office of the dean to the corps area surgeon of the corps area in which the applicant resides.

Students of the Medical Reserve Officers' Training Corps should continue as before, with a view of obtaining commissions as First Lieutenant, Medical Reserve Corps, on graduation.

Students who hold commissions come under the jurisdiction of the Army and Navy authorities and are not subject to induction under the Selective Service acts. The Army and Navy authorities will defer calling these officers to active duty until they have completed their medical education.

All students who are disqualified physically for commissions should apply for deferment in accordance with the instructions already referred to.

RECENT GRADUATES

After successful completion of his medical college course every individual holding commission as Second Lieutenant, Medical Administrative Corps, Army of the United States, should make immediate application to the Adjutant General, United States Army, Washington, D. C., for appointment as First Lieutenant, Medical or Dental Corps, Army of the United States. Every individual holding commission as Ensign H-V (P), U. S. Naval Reserve, should make immediate application to the commandant of his naval district for commission as Lieutenant (j. g.), Medical or Dental Corps Reserve, U. S. Navy. If appointment is desired in the grade of Lieutenant (j. g.) in the regular Medical Corps or Dental Corps of the U. S. Navy, application should be made to the Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

The Public Health Service contacts senior and junior medical students for the purpose of interesting the students in applying for positions as interns, following the successful completion of the school year. In addition the students that are accepted are offered commissions in the reserve, to be inactive during the period of their internship and to become active following the successful completion of their internship.

TWELVE MONTHS INTERNS

All interns should apply for commissions as First Lieutenant, Medical or Dental Corps, Army of the United States, or as Lieutenant (j. g.), United States Navy or Naval Reserve. After completion of twelve months' internship, except in rare instances in which the necessity of continuation as a member of the staff or as a resident can be defended by the institution, all who are physically fit may be required to enter military service. Those commissioned may then expect to enter military service in their professional capacity as medical or dental officers.

HOSPITAL STAFF MEMBERS

Interns with more than twelve months of internship, assistant residents, fellows, residents,

junior staff members and staff members under the age of 45 fall within the provisions of the Selective Service acts.

All such men holding Army commissions are subject to call at any time. Temporary deferment is possible if an application made by the institution to the Adjutant General of the United States Army certifying that the individual is temporarily indispensable is approved.

All such men holding Naval Reserve commissions are subject to call at any time, at the discretion of the Secretary of the Navy. Temporary deferments are granted only on approval of applications made by the institution to the Surgeon General of the Navy.

THOSE UNDER 45

All male physicians, dentists or veterinarians under 45 are liable for military service. That their services may be utilized in a professional capacity as officers, they should be made available through the facilities of the Procurement and Assignment Service. Wherever possible, their present positions in civil life should be filled or provisions made for filling their positions, if necessary, by (*a*) those who are over 45, (*b*) those under 45 who are physically disqualified for military service, (*c*) women and (*d*) instructors and those engaged in research who do not possess M.D., D.D.S. or D.V.M. degrees but whose utilization would make available physicians, dentists or veterinarians for military service.

THOSE OVER 45

All physicians, dentists or veterinarians over 45 should enroll with the Procurement and Assignment Service. Every possible effort will be made to retain those who are essential in their present capacities. Those who are available for assignment to military, governmental, industrial or civil agencies may be asked by the Procurement and Assignment Service to serve those agencies.

MAINTAINING EDUCATIONAL, INDUSTRIAL AND CIVILIAN MEDICAL, DENTAL AND VETERINARY SERVICES

Faculties of Schools.—Authorities in medical, dental and veterinary schools have forwarded lists to the Procurement and Assignment Service containing the names of members of their faculties who are considered essential to a proper continuation of medical, dental and veterinary education. These lists will be consulted in determining those who are considered essential. Should the status of any individual listed as essential for teaching be changed, the Procurement and Assignment Service should be immediately notified by the college authorities.

Research.—The burden of proof as to the essential character of research set forth as a reason for deferment rests on the individual and the employing institution. Efforts will be made to maintain without interruption the progress of scientific research, particularly that related to the war effort.

Civil Practice.—The Procurement and Assignment Service will do its utmost to maintain a supply of medical, dental and veterinary services for all industrial and civilian needs. Already the state and county medical, dental and veterinary societies, under the direction of state chairmen, are assembling lists of physicians, dentists and veterinarians considered essential in the positions they now occupy.

ADVISORY COMMITTEES AND LIAISON OFFICERS

On recommendations of the Directing Board of the Procurement and Assignment Service, the Office of Defense, Health and Welfare Services has appointed the following advisory committees and consultants to the Procurement and Assignment Service: Dentistry, Veterinary Medicine, Hospitals, Women Physicians, Industrial Health and Medicine, Medical Education, Negro Physicians and Public Health.

These committees are advisory to the Directing Board in establishing policies regarding the availability and utilization of personnel in their respective fields.

THE COMMITTEE ON INFORMATION

With its consultants, the Committee on Information is charged with disseminating information to all physicians, dentists and veterinarians and to the public in order that they may be kept informed of the progress of the Procurement and Assignment Service, and in order to secure their cooperation in its activities.

LIAISON OFFICERS

Each of the governmental agencies utilizing the services of physicians, dentists and veter-

inarians has appointed a liaison officer to advise and assist the Procurement and Assignment Service.

SPECIAL INFORMATION

Specialization.—In general, determination as to special qualifiations of persons entering the medical services of the Army and Navy depends on the classification of specialists by advisory committees established through the Division of Medical Sciences of the National Research Council and certifications of boards in the various specialties. Moreover, the recommendations of state and county committees and the statements, of the individuals on questionnaires will be taken into consideration. On questions of dental and veterinary specialization, the official organization will be consulted.

Citizenship.—Regulations of the United States Army and Navy do not permit the commissioning of officers who are not citizens of the United States. A commission in the United States Navy requires full citizenship for a period of ten years, and the ten year period to have been spent in the United States. Similarly, all federal agencies utilizing physicians, dentists and veterinarians now demand citizenship as a prerequisite to such enrollment.

Persons who do not possess full citizenship papers but who have been licensed to practice in any of the states of the United States should enroll with the Procurement and Assignment Service so that their services may be utilized when the opportunity arises. They should, however, do their utmost to continue in their efforts to secure citizenship to enable them to qualify for positions that they are not able to fill because of lack of these essentials.

Physicians, dentists or veterinarians who have their first citizenship papers but who do not have a license to practice and who are under the age of 45 come within the provisions of the Selective Service acts and may be inducted in the capacity of enlisted men. When this occurs, these should make known their special capacities, so that their services may be utilized to the fullest extent in the medical departments of the Army and Navy in an enlisted capacity.

College Qualifications.—Commissions in the medical departments of the United States Army and Navy and in federal agencies are granted only to graduates of schools recognized by such agencies. For physicians, twelve months of internship or its equivalent is required.

Those wishing further information concerning the qualifications necessary to appear for examination leading to a commission in the Army or Navy or to service with any other governmental service should apply directly to such agency.

Women Physicians, Dentists and Veterinarians.—The United States Army and Navy do not permit the commissioning of women physicians, dentists or veterinarians. However, all should enroll with the Procurement and Assignment Service so that they may be recommended to such positions as are available in other federal agencies, industry or civilian capacities in which their services may be required.

The needs will no doubt be particularly acute in local, state and national institutions, in teaching and staff positions and in special occupations with the Office of Civilian Defense in the care of women and children under emergency conditions.

★ ★

PHYSICIANS NEEDED IN THE PANAMA CANAL ZONE

Physicians are urgently needed at the Panama Canal — one of the nation's most vital defense areas. There is a splendid opportunity here for doctors to assist their country during the present emergency.

The U. S. Civil Service Commission has just announced an examination to secure physicians for these important positions. The entrance salary is $4,000 a year, and free transportation by boat or plane is furnished from port of embarkation, the salary beginning on the date of departure from the United States. Applications will be accepted by the Commission in Washington, D. C., until further notice. There is no written test.

Applicants must have been graduated from a Class A medical school with a degree of M.D. subsequent to May 1, 1920, and, in addition, must have had at least 1 year of experience in a hospital since graduation. Graduates from schools which require the completion of the internship before granting the M.D. degree (five-year schools) will be regarded as having met the hospital experience requirement. Applicants must not have passed their fiftieth birthday; however, because of the arduous duties in

the tropical climate, applicants between 25 and 35 years of age are preferred.

Applicants must be in sound physical health; they must be active and capable of arduous work. Although appointees are required to pass a thorough medical examination, the physical requirements are not as high as for the army or navy service.

The duties of the position are to serve as District Physician in a small Government dispensary; have general supervision over all medical and surgical activities in the dispensary; operate a general medical and surgical clinic; examine persons entering The Panama Canal Service; visit patients day or night in their homes and on board ship; and to be in charge of business activities of the dispensary.

Further information is given in the announcements which may be obtained, with application forms, at any first- or second-class post office, or from the U. S. Civil Service Commission, Washington, D. C.

★ ★

UNITED STATES CIVIL SERVICE EXAMINATION

GRADUATE NURSE

Optional Branches

1. General Staff Duty
2. Psychiatry

Panama Canal Service Only

Applications will be rated as soon as practicable after receipt at the U. S. Civil Service Commission, Washington, D. C., and certification made as the needs of the service require. When sufficient eligibles are obtained, the receipt of applications will be closed, in which case due notice will be given.

The United States Civil Service Commission hereby amends Announcement No. 142 of 1941 to substitute the following paragraph for the first paragraph in the section "Salaries and deductions for subsistence and quarters:"

"Salaries and deductions for subsistence and quarters. — The entrance salary for nurses is $168.75 per month. Promotion may be made at the end of the quarter following the first 18 months of service to $175.00 per month, at the end of the quarter of the succeeding 18 months of service to $181.25 and thereafter at such intervals and in such amounts until a maximum rate of $206.25 is reached, depending upon effective work performance. Such increases come within the terms of the general administrative promotion plan for positions within the scope of the Classification Act of 1923 as amended."

Further information regarding this examination is contained in the original announcement.

★ ★

ORTHOPEDIC MECHANIC POSITIONS OPEN IN GOVERNMENT SERVICE

An examination has been announced by the Federal Civil Service Commission to secure Orthopedic Mechanics for the Army services. The salary is $2,000 a year. Persons may qualify under the following optional subjects: (1) General, (2) Bracemaker, (3) Shoemaker and Leatherworker, and (4) Limbmaker. Because of the demand for qualified eligibles, applications will be accepted at the Civil Service Commission's Washington office until further public notice.

Persons appointed will construct, design, alter, and repair orthopedic appliances as indicated by the optional subjects. This includes working from living models and plaster casts, doing nickel plating, and shaping, grinding, and polishing metals used in orthopedic appliances.

Applicants will not take a written test but will be rated on the extent and quality of their experience. They must have had 5 years of appropriate experience in orthopedic work within the past 10 years. Under the option "Shoemaker and Leatherworker" persons whose experience has been in general shoe repair will not be considered qualified.

Examination announcements and application forms may be obtained at first- and second-class post offices and from the Civil Service Commission, Washington, D. C.

★ ★

We must recognize the fact that tuberculosis begins in the human body when the tubercle bacillus is first lodged in the tissues and that whatever occurs subquent to this is largely beyond our control. The disease may be interrupted permanently by the body's defense mechanism soon after it begins; it may be interrupted temporarily on numerous occasions but eventually may reach its ultimate goal by destroying parts or even the life of the body. J. A. Myers, M.D., Ann'l Meeting, Nat'l Tuber. Assn., 1940.

Original Articles

ABNORMALITIES OF INTRAUTERINE ENVIRONMENT ASSOCIATED WITH 2000 FETAL AND NEONATAL DEATHS*

EDITH L. POTTER, M.D., Ph.D.
CHICAGO

An account of the pathologic lesions found at the postmortem examination of 2000 fetuses who were stillborn and infants who died during the first month of life has recently been published from this department and included with it was a brief survey of some of the obstetric factors associated with the birth of these babies.[1] I propose in this paper to deal in detail with abnormalities of the fetal environment and to include the various complications and conditions found in the mother and the fetal adnexa (cord and placenta) which were responsible for, contributed to, or were coincidental with the death of the fetuses and infants.

The source of the material and the methods used in its preparation have been described in the previous publication and will not be repeated.[1] The study is based on the maternal histories and the postmortem examinations of 2000 dead fetuses and infants. Included were 652 (32.6%) who died before the onset of labor, 553 (27.6%) who died during labor, and 795 (39.8%) who were born alive but died at less than one month of age. They were divided according to length of gestation into those born as previable[(a)] 410 (20.5%), as viable premature[(b)] 752 (37.6%) and as term infants 838 (41.9%).

It was possible to demonstrate pathologic lesions indicative of a probable cause of death in 1130 (56.5%). The less advanced the period of gestation at which an infant is delivered, or the longer a fetus has been dead in utero before delivery, the greater is the probability that no abnormalities will be found. Among those who were delivered in the previable period and who were dead before the onset of labor a cause of death could be found at autopsy in only 20 per cent, while at the opposite end of the scale were those delivered at term who died after birth, and in these a cause of death could be demonstrated in 87 per cent.

Since examination of the body of the fetus or infant discloses the reasons for its failure to survive only slightly more than half the time, an investigation of the environment in which it developed and the conditions which surrounded its birth are essential to a complete understanding of the reasons for its death. Unfortunately even with this added information we still have no explanation to offer for approximately one-fifth of all fatalities (21.6%). One or more abnormalities consisting of disturbances in the health of the mother, of interference with circulation through the placenta or umbilical cord, or of pathologic states developing incident to labor or

From the Department of Obstetrics and Gynecology, The University of Chicago and the Chicago Lying-in Hospital.

*Assistance in the preparation of these materials was furnished by the personnel of Work Projects Administration Official Project No. O.P.665-54-3-387.

(a) Two of the three following criteria: weight from 400 to 999 gm., length from 22.1 to 35 cm., menstrual age 22 through 28 weeks. This division is an arbitrary one used since the Illinois law requires the reporting of all still-births in which the fetus is advanced to the fifth month of gestation. This group includes those fetuses and infants which must be reported and considered as deaths but in which the infant practically never survives after birth.

(b) Two of the three following criteria: weight from 1000 to 2499 gm., length from 35.1 to 47 cm., menstrual age 29 through 37 weeks. Infants and fetuses falling in this group are hereafter referred to only as "premature."

delivery were found 1006 times.* These occurred in association with 335 (51.3%) of the antepartum deaths, 340 (61.4%) of the intrapartum deaths, and 331 (41.6%) of the neonatal deaths. They were found when delivery took place during the previable period in 201 (49.0%) cases, the premature period in 402 (53.4%) and at term in 403 (48.0%). It is thus evident that there is no appreciable excess of environmental abnormalities associated with death at any particular gestational age (after the period when the birth of the fetus must be reported) or with its occurrence at any special time in relation to the process of birth.

Since there were 138 infants in whose environment more than one disturbance existed, the presentation of our data must take this into account. Each individual case was carefully studied and the complication which seemed of most importance in relation to the fatal outcome was chosen. (Table I) The figures used in all discussions pertaining to method of delivery and pathologic lesions in the infants include only one complication for each infant and total 1006. In the general figures showing the occurrence of these environmental states in relation to gestational age and time of death it seemed that a more accurate picture could be obtained by including all of the complications so that in these figures the total is 1144.

Table I

Abnormalities Present in the Intrauterine Environment of 1006 Fetuses and Infants

	Total Complications	Most Important Complications
Toxemia	253	215
Hemorrhage		
Abruptio placentae	151	152
Placenta previa	101	99
Nonspecific hemorrhage	59	55
Cord abnormalities		
Prolapse	61	48
Entanglements	74	62
Medical complications		
Syphilis	72	57
Other diseases unrelated to pregnancy	91	82
Conditions leading to abnormal labor or difficult delivery	93	91
Miscellaneous	189	145
Total	1144	1006

*Prolongation of labor without statement as to cause was not included. Length of labor is discussed near the end of the paper.

TOXEMIA

Toxemia in the mother was the complication most commonly observed and was present in 253 or 12.7 per cent of the total group. Dieckmann[2] finds a 7 per cent incidence of toxemia among the patients delivered at the Chicago Lying-in Hospital and since this figure is necessarily higher than it would be for non-hospitalized individuals, the incidence of 12.7 per cent must be well over twice that which occurs among all pregnant women. Included in this general category in the present study were simple toxemia (the majority being pre-eclampsia), 195, eclampsia 21, hypertension alone 30, hyperemesis gravidarum 7.

The incidence of pre-eclamptic toxemia is approximately the same at all gestational ages after the fifth month of gestation and was present in association with death during the previable period in 8.5 per cent (35), the premature period in 11.9 per cent (90), and at term in 8.3 per cent (70): a far greater actual number occurred among both premature and term infants than among the previables. (Table II) The incidence in relation to the time of death is 14.5 per cent (95) in the antepartum period, 6.1 per cent (34) in the intrapartum period and 8.3 per cent (66) in the neonatal period. (Table III)

The frequency of eclampsia was approximately the same in stillborn and liveborn infants. Among antepartum deaths it was 1.5 per cent (10), intrapartum 0.75 per cent (4) and neonatal deaths .88 per cent (7). It was also much the same at all periods of gestation; among those dying in the previable period it was 1.2 per cent (5), in the premature period 1.0 per cent (9), and in those at term 0.92 per cent (7). Among the thirty deaths in which maternal hypertension alone was recorded, only one was in a previable fetus and the other 29 were almost equally divided between term and premature infants. This suggests that if hypertension alone plays a part in producing fetal death it is most apt to be effective toward the end of pregnancy. Hyperemesis was not stated to have occurred in any of the women whose infants died at term; two deaths were in the previable period and five in the premature period.

Table II
Incidence of Environmental Abnormalities in Relation to Total Number of Infants and Fetuses Delivered at Different Periods of Gestation

	Previable		Premature		Term		Total	
	No.	%	No.	%	No.	%	No.	%
Toxemia	42	10.2	118	16.0	93	11.0	253	12.7
Hemorrhage								
Abruptio placentae	33	8.0	69	9.0	49	5.8	151	7.5
Placenta previa	21	5.1	65	8.6	15	1.7	101	5.0
Nonspecific hemorrhage	25	6.1	21	2.8	13	1.5	59	3.0
Cord abnormalities								
Prolapse	4	1.0	23	3.1	34	4.0	61	3.1
Entanglements	4	1.0	19	2.5	51	6.0	74	3.7
Medical complications								
Syphilis	12	2.9	29	3.8	31	3.7	72	3.6
Other diseases unrelated to pregnancy	25	6.1	38	5.0	28	3.4	91	4.5
Conditions leading to abnormal labor or difficult delivery	0	0	17	2.2	76	9.0	93	4.7
Miscellaneous	50	12.2	66	8.7	73	8.7	189	9.4
Total	216	52.6	465	61.7	463	54.8	1144	57.2
No environmental abnormalities	194	47.4	288	38.3	375	45.2	856	42.8
Total cases	410	100	752	100	838	100	2000	100

Table III
Incidence of Environmental Abnormalities in Relation to Time of Death in Total Number of Infants and Fetuses

	Antepartum Deaths		Intrapartum Deaths		Neonatal Deaths		Total	
	No.	%	No.	%	No.	%	No.	%
Toxemia	119	18.2	44	7.9	90	11.3	253	12.7
Hemorrhage								
Abruptio placentae	67	10.3	60	10.6	24	3.0	151	7.5
Placenta previa	16	2.4	32	5.8	53	6.7	101	5.0
Nonspecific hemorrhage	14	2.1	13	2.3	32	4.0	59	3.0
Cord abnormalities								
Prolapse	7	1.1	44	7.9	10	1.3	61	3.1
Entanglements	35	5.4	32	5.8	7	0.8	74	3.7
Medical complications								
Syphilis	38	5.8	17	3.1	17	2.1	72	3.6
Other diseases unrelated to pregnancy	26	3.9	24	4.3	41	5.3	91	4.5
Conditions leading to abnormal labor or difficult delivery	0	0	57	10.3	36	4.5	93	4.7
Miscellaneous	45	6.9	68	12.3	76	9.6	189	9.4
Total	367	56.1	391	70.3	386	48.6	1144	57.2
No environmental abnormalities	285	43.9	162	29.7	409	51.4	856	100
Total cases	652	100.	553	100.	795	100.	2000	100.

The method of delivery was, in the majority of instances, apparently not altered by the presence of a toxemia. Natural cephalic and breech deliveries and versions and extraction each show a three per cent lower incidence than is found in the entire group (Table IV); forceps deliveries are about the same; delivery by Cesarean section, however, occurred in 12.5 per cent of all toxemic patients in contrast to 5.0 per cent in the entire group. The incidence of Cesarean sections is exceeded only in those women suffering from placenta previa and abruptio placentae.

Table IV
Method of Delivery in Relation to Abnormalities of Fetal Environment

	Natural Cephalic		Breech		Low Forceps		Mid or High Forceps		Version & Extraction		Cesarean Section		Other		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Toxemia	122	56.5	28	13.0	17	7.7	7	3.2	2	0.9	27	12.5	12	5.5	215	100
Abruptio Placentae	78	51.4	24	15.7	5	3.3	3	1.9	10	6.5	23	15.1	9	5.9	152	100
Placenta Previa	27	27.3	13	13.1	3	3.0	1	1.0	18	18.2	20	20.2	17	17.2	99	100
Minor hemorrhage and cord entanglements	70	59.6	27	23.2	10	8.6	2	1.7	0		0		8	6.9	117	100
Cord prolapse	13	27.0	12	25.0	4	8.3	3	6.3	7	14.6	0		9	18.7	48	100
Syphilis	44	77.5	8	13.8	1	1.7	1	1.7					3	5.3	57	100
Diseases unrelated to pregnancy	47	60.8	12	13.6	3	3.3	5	5.6	1	1.1	5	5.6	9	10.0	82	100
Conditions leading to abnormal labor or difficult delivery	15	16.4	12	13.1	13	14.2	21	23.0	6	6.6	12	13.1	12	13.1	91	100
Miscellaneous	103	70.8	11	7.6	8	5.5	4	2.7	6	4.1	3	2.5	10	6.8	145	100
No environmental abnormalities	667	66.8	179	18.2	69	7.0	15	1.5	24	2.3	10	1.0	31	3.2	994	100
Total	1185	59.2	326	16.3	133	6.7	62	3.1	74	3.7	100	5.0	120	6.0	2000	100

Table V
Incidence of Pathologic States Found at Autopsy in Relation to Environmental Abnormalities

	No Abnormalities		Traumatic Hemorrhage		Asphyxial Hemorrhage		Malformations		Miscellaneous		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Toxemia	120	55.8	28	13.0	30	13.9	14	6.5	38	10.8	215	100
Abruptio placentae	46	30.3	13	8.5	80	52.7	4	2.6	9	5.9	152	
Placenta previa	44	44.4	15	15.1	26	26.3	2	2.0	12	12.2	99	
Minor hemorrhage and cord entanglements	64	54.8	10	8.5	24	20.5	9	7.7	10	8.5	48	
Prolapsed cord	11	22.9	12	25.0	22	46.0	1	2.1	2	1.4	117	
Syphilis	24	41.4	5	8.6	5	8.6	0	0	23	41.4	82	
Diseases unrelated to pregnancy	43	49.4	14	17.2	10	11.5	7	8.2	8	13.7	91	
Conditions leading to abnormal labor or difficult delivery	18	20.0	37	41.2	17	18.9	6	6.6	13	13.3	57	
Miscellaneous	57	39.5	2	1.4	22	15.1	25	17.2	39	26.8	145	
No complications	443	44.3	138	13.8	142	14.2	141	14.1	130	13.0	994	100
Total	870	43.5	274	13.7	378	18.9	209	10.4	269	13.5	2000	

Pathologic lesions in the infants. No abnormalities were demonstrable in 120 (55.8%) (Table V) of the fetuses and infants, but only 13 of these were nonmacerated and at term. Intracranial or other hemorrhage was present in 28 (13.0%) although 3 died before the onset of labor and in these birth trauma could not have been a cause of death. Thirty (13.9%) exhibited petechial hemorrhages in the viscera and were believed to have died of asphyxia.* Six of these died after birth, but in only two was respiration established. Malformations were present in 14 (6.6%) infants, a considerably lower incidence than was found in the entire series (10.3%). It is impossible to determine which of the fetuses and infants succumbed directly as a result of the toxemia and which died coincidentally. Unfortunately toxemia produces no recognizable changes in the fetal tissues and it is too often concluded that the presence of such a condition is the cause of the fatal outcome. Actually only a small percentage of the

*In this paper "asphyxia" is used to mean a condition in the fetus resulting from oxygen deprivation caused by obstruction to the umbilical circulation.

Table VI
Incidence of Environmental Abnormalities in Relation to Pathologic Conditions Found at Autopsy

	No Abnormalities		Traumatic Hemorrhage		Asphyxial Hemorrhage		Malformations		Miscellaneous		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Toxemia	120	13.7	28	10.2	30	7.9	14	6.6	38	8.5	215	
Abruptio placentae	46	5.3	13	4.7	80	21.0	4	1.9	9	3.3	152	
Placenta previa	44	5.0	15	5.5	26	6.8	2	1.0	12	4.4	99	
Minor hemorrhage and cord entanglements	64	7.3	10	3.6	24	6.3	9	4.3	10	3.6	48	
Prolapsed cord	11	1.3	12	4.4	22	5.7	1	0.5	2	0.7	117	
Syphilis	24	2.7	5	1.8	5	1.3	0	0	23	8.3	82	
Diseases unrelated to pregnancy	43	4.9	14	5.1	10	2.6	7	3.4	8	2.9	91	
Conditions leading to abnormal labor or difficult delivery	18	2.1	37	13.5	17	4.4	6	2.9	13	4.8	57	
Miscellaneous	57	6.8	2	0.7	22	6.6	25	11.9	39	14.4	145	
No complications	443	50.9	138	50.4	142	37.4	141	67.5	130	49.1	994	
Total	870	100.0	274	100.0	378	100.0	209	100.0	269	100.0	2000	100

offspring of toxemic mothers fail to survive, and in any group of dead fetuses and infants there is always a larger number who are born of nontoxemic than toxemic mothers in whom no abnormalities can be demonstrated. In this study among the 967 fetuses and infants in whom no environmental abnormalities were present, 433 failed to show demonstrable pathologic lesions. It does not seem justifiable to state that an infant succumbed from maternal toxemia only because this condition was present and no specific cause of death could be found.

Maternal toxemia of some type was associated with 13.7 per cent (120) of the infants and fetuses showing no abnormalities at autopsy (Table VI). It was present in 10.2 per cent (28) of those having traumatic hemorrhage, 7.9 per cent (30) of those showing evidence of asphyxia, 6.6 per cent (14) of those with malformations, and 8.5 per cent (23) of those with miscellaneous conditions.

HEMORRHAGE

Some form of maternal hemorrhage occurred in association with 311 deaths. In 151 the hemorrhage was due to premature detachment of the placenta, in 101 to placenta previa, and in 59 to an unknown cause.

Premature Detachment of the Placenta.

Among the 151 infants and fetuses who succumbed following premature detachment of the placenta there was an 8.0 per cent (33) incidence among previable infants, 9.0 per cent (69) among premature and 5.8 per cent (49) among those at term. The incidence was 10.3 per cent (67) in those who died before the onset of labor, 10.6 per cent (60) in those who died during labor, and 3.0 per cent (24) in those who died after birth.

Method of delivery. Labor was terminated by natural cephalic delivery in 51.4 per cent (78) of the cases in which premature detachment of the placenta took place, a proportion almost as high as in the total group (59.4%); by breech delivery in 15.7 per cent (24); low forceps 3.3 per cent (5), mid or high forceps 1.9 per cent (3); version and extraction 6.5 per cent (10), Cesarean section 15.1 per cent (23), and other forms of delivery 5.9 per cent (9). The incidence of Cesarean section is three times as great as in the total group and accounts for almost one-fourth (23.0%) of all deliveries by this method. Only the incidence of Cesarean section performed in association with placenta previa exceeds that for premature placental detachment. The incidence of version and extraction is twice as great as in the entire group.

Pathologic lesions in the infants. No demonstrable abnormalities were present in 30.3 per cent (46) of the infants and fetuses dying in association with premature detachment of the placenta. Over one-half, 52.7 per cent (80), as would be anticipated, exhibited definite evidence of an interrupted circulation in the form of petechial hemorrhages. The incidence of traumatic hemorrhage, 8.5 per cent (13), is as low as in any group indicating that whatever steps may have been instituted for the control

of hemorrhage or the delivery of the infant, did not, in the majority of cases, produce injury. The incidence of malformations, 2.6 per cent (4), and miscellaneous conditions, 5.9 per cent (9), are also proportionately low.

Premature detachment of the placenta was present in association with 5.3 per cent (46) of the cases in which no abnormalities were found in the infant or fetus at autopsy, 4.7 per cent (13) of those with traumatic hemorrhage, 1.9 per cent (4) of those with malformations, and was highest, 21.0 per cent (80), in those showing evidence of asphyxia.

Placenta Previa.

Placenta previa was the third most common individual complication which was found in this study. It occurred in 101 or 5.0 per cent of the total cases. In association with those delivered in the previable period it was 5.1 per cent (21), premature 8.6 per cent (65), term 1.7 per cent (15), the incidence being considerably higher among the previable and premature infants than in those at term. This would indicate that symptoms from placenta previa usually occur during the latter months of pregnancy but before the normal end of gestation. It was associated with death in the antepartum period in 2.4 per cent (16) of all fetuses dying at this time, in 5.8 per cent (32) in the intrapartum period, in 6.7 per cent (53) in the neonatal period.

According to Davis,[3] at the Chicago Lying-in Hospital the incidence of placenta previa in the last four years has been 1:102 or practically one per cent of all patients delivered. The incidence in this study is 1:20 or almost five times that found in the total group of hospital deliveries. Other clinics in the United States report an incidence of placenta previa varying from 1:92 to 1:159. The death rate including all fetuses stillborn or infants dying after birth whose weight exceeded 400 grams at the Chicago Lying-in Hospital is 40 per cent in 122 consecutive cases of placenta previa. It is interesting to note that in the Lying-in Hospital study although 55 infants were at term only 5 of this group died or were stillborn (9.0%) while among the 67 previable and premature infants, 43 died or were stillborn (64.2%).

Type of Delivery. In the present series only 27.3 per cent of the fetuses and infants born of the mothers in whom this complication was present were delivered naturally with a cephalic presentation. This is less than half the number of such deliveries in the entire group. Breech deliveries were only slightly less frequent than in the entire group (13.1%) but low forceps were applied only half as often (3.0%) and mid or high forceps only one-third as commonly (1.0%). Version and extraction, however, is over five times (18.2%), and Cesarean section four times (20.2%) as common as in the entire group. One-fourth of all verisions and extractions and one-fifth of all Cesarean sections are found in association with placenta previa.

Pathologic lesions in the infants. Among the infants born of mothers with placenta previa 44.4 per cent showed no abnormalities at postmortem examination, 15.1 per cent had traumatic hemorrhage, 26.3 per cent had evidence of asphyxia, 12.2 per cent miscellaneous conditions and only 2.0 per cent had malformations. Of the infants showing no abnormalities 5 per cent were associated with placenta previa in the mother; of those with intracranial and other hemorrhages 5.5 per cent, evidence of asphyxia 6.8 per cent, malformations only 1 per cent and of those with miscellaneous conditions 4.4 per cent were born of mothers with placenta previa.

The incidence of placenta previa is much the same in association with the various pathologic lesions found in the entire group of infants, with the exception of a slightly increased rate among those with asphyxia and and unusual decrease in those with malformations. In view of Greenhill's[4] statement that malformations are much more common in association with placenta previa than with normal placental implantation and his conclusions that placenta previa is probably a causative factor in malformations, the exceedingly low incidence in this series of malformations in the group of mothers with placenta previa (2.0%), and the low incidence of placenta previa among the infants with malformations (1.0%) is most interesting. At the Chicago Lying-in Hospital among 48 deaths associated with placenta previa only one malformation was found, an incidence of 2.0 per cent. Malformations were found in 18.0 per cent of 526 autopsies performed on infants and fetuses delivered in the same institution.[5]

INTERFERENCE WITH CIRCULATION THROUGH THE UMBILICAL CORD

Some form of obstruction to circulation through the cord was stated to have occurred in association with 135 deaths; 61 of these were true prolapse, 74 were diagnosed as "cord around the neck, arm etc." or other entanglements.

Prolapse of the Umbilical Cord.

Prolapse of the cord occurred in association with the birth of only 1 per cent of the previable infants and fetuses, 3.1 per cent of the premature and 4.0 per cent of those at term. It also occurred in 1.1 per cent of those who died before the onset of labor, 1.3 per cent of those who died after birth, but in a much higher percentage of those who died during labor — 7.9 per cent. The usual time of cord prolapse is during labor and if it occurs then the infant usually dies before delivery.

Method of delivery. Only 27.0 per cent of all infants with a prolapsed cord were delivered naturally with cephalic presentations, and 25 per cent with breech presentations. The incidence of natural cephalic deliveries is only one-half, while that of breech deliveries is twice the figure for the entire group. All types of forceps were proportionately somewhat more frequent (low forceps 8.3%, mid and high forceps 6.3%), while delivery by version and extraction (14.6%) was much more frequent and was exceeded only by its occurrence in placenta previa. There were no deliveries by Cesarean section in association with prolapse of the cord. Other forms of delivery, including craniotomy, Braxton-Hicks version, etc. accounted for 18.7 per cent, a figure almost six times as great as for the entire group, and higher than its association with any other condition.

Pathologic lesions in the infants. In only 22.9 per cent of the infants were pathologic lesions absent, and in almost half, 46.0 per cent, there were hemorrhages definitely characteristic of those found in association with asphyxia. In 25.0 per cent intracranial or other traumatic hemorrhage was present, an incidence twice as great as that which occurs in the absence of any form of complication, and one which is exceeded only by that group in which there was a definite statement that labor was abnormal or delivery difficult. Malformations were present in only 2.1 per cent, and miscellaneous conditions in 1.4 per cent. These figures indicate that in over half of the infants death was probably due to a direct cutting off the circulation through the cord, but that in an additional one-fourth operative procedures which resulted in fatal injury were undertaken to expedite delivery of the infant.

The incidence of prolapsed cord was only 5.7 per cent among the infants and fetuses showing evidence of asphyxia at autopsy, 4.4 per cent in those with traumatic hemorrhage, 1.3 per cent in those showing no abnormalities and only 0.5 per cent in infants exhibiting malformations.

HEMORRHAGE UNDIAGNOSED AS TO CAUSE; CORD ENTANGLEMENTS

These two conditions have been combined for study because of the possibility that each may lead to interference with fetal circulation, and because of the impossibility of definitely estimating their significance in relation to the fatal outcome.

Hemorrhage of Unknown Origin.

Hemorrhage of unknown origin occurred in 59 women, almost half (25) associated with delivery during the previable period, 21 during the premature period and only 13 at term. In over half (32) death did not occur until after delivery and the majority of these deaths were due to immaturity; only 6 infants were at term. Thirteen died in the intrapartum and 14 in the antepartum period.

Cord Entanglements.

Cord entanglements occurred in 74 instances. Two-thirds (51) of the infants were at term and in the other third 19 were premature, 4 were previable. Slightly less than half (35) of the deaths occurred before the onset of labor, almost as many (32) during labor and only 7 after birth. All of those in whom death occurred after birth were at term.

In the combined groups of non-specific hemorrhages and cord entanglements 54.8 per cent of the infants and fetuses failed to show abnormalities at autopsy, but only 10 of the total 132 were neonatal deaths in term infants. One-fourth (20.5%) exhibited evidence of asphyxia, 8.5 per cent traumatic hemorrhage, 7.7 malformations and 8.5 per cent miscellaneous conditions.

The incidence of non-specific hemorrhage or cord entanglements was somewhat lower in those infants with traumatic hemorrhage (3.6%) and higher (7.3%) in those showing no abnormalities than in those with evidence of asphyxia (6.3%) and malformations (4.3%).

MEDICAL CONDITIONS UNASSOCIATED WITH PREGNANCY

This diagnosis was made 163 times and includes 72 cases of syphilis.

Syphilis.

A diagnosis of syphilis had been made before or during pregnancy in 72 or 3.6 per cent of all mothers in the series. This was based on a history of infection, of treatments, or on a positive Wassermann reaction. Practically all patients had had treatment and in some it had extended over a period of several years. In only 25 infants or fetuses was evidence of syphilis demonstrable. Seventeen of these died before the onset of labor, 3 during labor and 5 after birth. Two were previable, 16 premature and 7 were at term. All deliveries were non-instrumental, 20 being cephalic, 5 breech.

It is interesting to note that of the 479 macerated babies which were included in this series only 17 or 3.5 per cent showed evidence of syphilis in spite of the fact that all macerated fetuses were carefully examined for evidence of this condition, and Levaditi stains for spirochetes were performed on the liver and adrenals of each fetus. The impression is still prevalent that maceration is usually indicative of syphilis. In our experience maceration is very infrequently due to syphilis.

Medical Conditions Exclusive of Syphilis.

Medical conditions exclusive of syphilis were present in 91 women and in an additional 3 non-gynecologic operations were performed. Cardiac disease, the condition most commonly encountered, was present in 23 or 1.5 per cent of the entire series. The other conditions diagnosed were diabetes 14, chronic glomerulonephritis 5, tuberculosis 4, acute respiratory infections 15, pyelitis 14, and other diseases 14.

Method of delivery. The number of deliveries accomplished by each method in mothers with medical complications follows very closely the proportionate number of each in the entire series. Although the total number in which forceps were applied is almost equal in both groups there are proportionately more mid forceps and fewer low forceps among the mothers with medical complications. In view of the small number of cases, however, this may be a coincidence.

Pathologic lesions in the infants. Half (49.4%) showed no abnormalities at autopsy, 17.2 per cent traumatic hemorrhage, 11.5 per cent evidence of asphyxia, and 8.2 per cent malformations. When all the infants in the series are grouped according to lesions present at autopsy, the incidence of medical complications in each group is much the same.

ABNORMAL LABOR AND DIFFICULT DELIVERY

A statement that labor was abnormal as a result of uterine inertia or abnormalities of the soft tissues was found in 26 instances, as a result of a contracted pelvis in 23, and that difficulty was encountered in effecting delivery in 44 instances. It did not occur in the previable period and only about one-fifth of the number were in the premature period. The incidence among all premature infants was 2.2 per cent, among infants at term 9.0 per cent. It was found in association with 10.3 per cent of the deaths during delivery, and 4.5 per cent of those in the neonatal period.

Method of delivery. In 23.0 per cent delivery was non-instrumental, 16.4 per cent being cephalic and 6.6 per cent breech. Difficulty was encountered in delivering the shoulders in the majority of these cephalic presentations. In 6.6 per cent forceps were applied to the aftercoming head; in 37.2 per cent forceps were applied to the forecoming head, 14.2 per cent being applied at the outlet, 23.0 per cent at the mid plane or higher. Version and extraction was performed in 6.6 per cent and Cesarean section in 13.1 per cent. In 13.1 per cent some type of destructive operation was done.

Pathologic lesions in the infants. Only 20 per cent failed to show definite pathologic lesions at autopsy, and this is the lowest incidence found in any group in the series. Intracranial or other traumatic hemorrhage was found in 41.2 per cent, a figure much higher than in any other group. Nineteen per cent showed evidence of asphyxia, 6.6 per cent were malformed, 13.3 per

cent had miscellaneous conditions, the majority being intrauterine pneumonia.

Difficult delivery or an abnormal labor was found in 13.5 per cent of the infants showing intracranial hemorrhage, 4.4 per cent of those showing evidence of asphyxia, 2.9 per cent of those with malformations and only 2.1 per cent of those showing no abnormalities.

OTHER COMPLICATIONS

Unattended Delivery.

Delivery was unattended by doctor or midwife in 33 instances. In 7 the fetus was previable, in 13 premature, and in 13 it was at term. Maceration was present in 4, death appeared to have occurred within a short time of delivery in 13, and 16 were alive at the time of birth.

A Fall or Other Form of Injury.

A fall or other form of injury was stated to have occurred within a short time before the onset of labor in 28 women. In 13 the fetus was previable, in 8 premature and in 7 it was at term. Thirteen deaths occurred before the onset of labor, 8 during labor, and 7 after birth. In none of these was there a premature detachment of the placenta or demonstrable evidence of injury to the fetus, so that the actual role of maternal injury as a cause of or contributing factor in these deaths is extremely difficult to evaluate.

Hydramnios.

Hydramnios was diagnosed 56 times and in the majority of instances was associated with fetal malformations. In 15 cases the fetus was previable, in 26 premature and in 15 it was at term. In 12 death took place before the onset of labor, in 14 during labor and in 30 after birth. Most of the infants who died after birth succumbed from major malformations.

Premature Rupture of Membranes.

Premature rupture of membranes was recorded in only 50 cases or 2.5 per cent of the entire series. This figure is probably much lower than the true incidence for in many cases accurate information on the time of rupture is lacking. Death occurred in the antepartum period in 13, during labor in 19, and after delivery in 18. Twelve were previable, 16 premature and 22 at term. Eight of the infants had pneumonia at the time of birth, four having died during delivery and four within a short time after delivery. This is a surprisingly low incidence of pneumonia in view of the fact that early rupture of membranes predisposes to infection of the amniotic fluid. In 9 there was evidence of birth trauma, in 7 evidence of asphyxia and a malformation in only one.

Shock and Vascular Collapse.

Shock and vascular collapse without hemorrhage and with subsequent recovery was present during the delivery of two term infants one of whom died during delivery and one soon after delivery. Both deaths were apparently due to anoxemia.

Rupture of the Uterus.

Rupture of the uterus was found in association with the deaths of 2 premature and 6 mature fetuses. All deaths occurred during labor except for one premature and one term infant who died after delivery.

Maternal Deaths.

Maternal death occurred 11 times. Two women died undelivered, one from hemorrhage and infection resulting from an undiagnosed rupture of the uterus, the other as a result of an acute fulminating toxemia with convulsions. Among the nine postpartum deaths there were four due to hemorrhage, 2 to eclampsia, and 2 to acute cardiac failure. One patient with an abruptio placentae died of shock immediately following a Porro Cesarean section, one delivered naturally but was subjected to a hysterectomy soon after delivery because of uncontrollable hemorrhage and died one and one-half hours afterward. One patient with placenta previa was subjected to manual dilatation and version and extraction because of failing fetal heart tones and death occurred within a few hours after delivery; the other patient with placenta previa had a twin pregnancy, the placenta of the first twin being over the internal os. Kielland forceps were applied to the head of the first twin in the midplane of the pelvis and a depressed skull fracture leading to fetal death from intracranial hemorrhage was produced. Maternal death occurred soon after delivery of the second twin, the cause presumably being hemorrhage from uterine atony. In both cardiac patients congestive heart failure developed during labor and

Table VII

Length of Labor in Relation to Anatomic Lesions of Infants Dying during Labor or after Birth

Length of Labor	No Abnormalities		Traumatic Hemorrhage		Asphyxial Hemorrhage		Malformations		Other Lesions		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Less than 2 hours	47	50.6	8	8.6	11	10.2	13	13.9	14	15.1	93	100
2.1 to 6 hours	125	44.1	31	10.9	50	17.4	40	14.0	38	13.4	285	100
6.1 to 24 hours	210	37.8	106	19.1	91	16.4	84	15.1	65	11.6	556	100
24.1 to 48 hours	39	28.5	51	37.2	17	12.4	13	9.5	17	12.4	137	100
Over 48 hours	15	27.3	22	40.0	9	16.4	13	5.5	—	—	65	100
Stated as prolonged only	6	40.0	5	33.3	2	13.3	0	0	—	—	15	100
Total	443	38.5	223	19.4	180	15.6	163	14.2	142	12.3	1151	100

death occurred soon after delivery; one was at term and was delivered with mid forceps, the other was at 26 weeks gestation and delivered spontaneously. Of the four toxemic patients, one previously mentioned died undelivered, one died almost immediately after delivery by craniotomy, one died the day following delivery by Cesarean section, and one whose infant showed evidence of erythroblastosis died within a few hours after a natural cephalic delivery.

LENGTH OF LABOR IN THE ENTIRE GROUP

The length of labor was given in the histories of 1151 infants who died during labor or after delivery and who were not delivered by Cesarean section. Labor was less than 2 hours in 8.2 per cent (93), 2 to 6 hours in 25.0 per cent (285), 6 to 24 hours in 48.7 per cent (556), 24 to 48 hours in 12.0 per cent (137) and more than 48 hours or stated as prolonged in 6.1 per cent (80).

The relationship of the length of labor to cause of fetal or infant death is shown in Table VII. The only causes of death which show any remarkable variation in relation to duration of labor are birth trauma and prematurity. The incidence of injury sustained during birth becomes progressively greater as the length of labor increases. It accounts for only 8.6 per cent of the deaths in which labor is less than 2 hours, but for 40.0 per cent of those in which it is over 48 hours. The incidence of prematurity in relation to the length of labor is in inverse order. Almost half (45.2 per cent) of the infants who died during or following a labor of less than 2 hours were premature and showed no pathologic lesions at autopsy while only 9.1 per cent died of prematurity alone when labor exceeded 48 hours. Labor in general is somewhat shorter when the infant is premature and dies without demonstrable pathologic lesions than it is in the entire group (42.6% of deaths from prematurity and 33.2% of the entire group had labors less than 6 hours) but is definitely shorter than among those infants showing evidence of birth trauma (17.5% had labors less than 6 hours). Thirty-two per cent of the infants with birth trauma were born after a labor of more than 24 hours, while there were 16.8 per cent in the entire group and only 8.2 per cent in the infants dying of prematurity.

CONCLUSIONS

It is evident from such a study that information concerning the environment of the fetus and infant from the time of conception until death and the knowledge which can be obtained by thorough postmortem examination of the effect of these environmental states are both essential for an evaluation of the causative factors associated with fetal and neonatal deaths. Even with complete histories and autopsies there still remain some deaths for which no explanation can be offered. In this series of 2000 cases, there were 433 (21.6%) in which no environmental abnormalities were noted and in which autopsy failed to disclose pathologic lesions. The majority of these deaths occurred before the onset of labor although many did not take place until after delivery; in the latter group most of the infants succumbed because of immaturity. Only 43 (2.1%) were infants at term who died during labor or after birth. As has been stated on previous occasions the two fields in which our

knowledge of how to further decrease the mortality is completely lacking, are in fetal deaths occurring before the onset of labor and in the premature onset of labor in the absence of discernable maternal abnormalities. The conditions of which we are cognizant that are most condusive to fetal and neonatal mortality are interference with fetal circulation before or during delivery, trauma sustained during delivery, and malformations. Improvement in obstetrical judgment and technical skill are the principal ways in which lowered mortality rates will be achieved.

SUMMARY

Some type of recognized disturbance in the environment of the fetus before birth was present in association with 51.6 per cent of 2000 deaths occurring prior to or during delivery or in the neonatal period. Maternal toxemia and states leading to interference with circulation through the umbilical cord or placenta comprised the majority of the complications. Less frequently encountered were syphilis and other diseases unassociated with pregnancy, maternal injuries, abnormal or prolonged labor or delivery and other miscellaneous conditions. Neither abnormalities of the environment nor pathologic states in the body of the fetus or infant could be found in 21.6 per cent of the total cases. Only 1.0 per cent of those failing to show pathologic changes were infants born alive at term.

BIBLIOGRAPHY

1. Potter, E. L., Fetal and Neonatal Deaths: A Statistical Analysis of 2000 Autopsies. JAMA 1940, 115: 996.
2. Dieckmann, W. J. and Brown, I., The Obstetric Management of Patients with Toxemia. Am. J. Obst. & Gynec. 1939, 38: 214.
3. Davis. Unpublished data.
4. Greenhill, J. P., Increased Incidence of Fetal Abnormalities in Cases of Placenta Previa. Am. J. Obst. & Gynec. 1939, 37: 624.
5. Potter, E. L. and Adair, F. L., Factors Associated with Fetal and Neonatal Deaths. JAMA 1939, 112: 1549.

A low standard of living is responsible for most of the tuberculosis among wage earners, rather than specific environmental factors. The influence of nutrition, fatigue, extremes of temperature and humidity and specific intoxications such as lead were studied and it was agreed that only nutrition had an appreciable effect upon tuberculosis incidences among workers. Of the respiratory irritants, including fumes and gases, as well as dusts, only free silica has a specific influence upon the disease. Leroy U. Gardner, M.D., Rep. Sixth Ann'l Meeting of Industr. Hygiene Foundation.

MANAGEMENT OF CHRONIC ARTHRITIS

EUGENE F. TRAUT, M.D.
CHICAGO

The so-called specific arthritides are the best understood group of chronic arthritis. They are due to generally accepted causes such as injury, gout and the definite infections: tuberculosis, gonorrhea and undulant fever.

Although the causes are well recognized, effective, particularized therapy exists only for gonorrhea and, to a less degree, for gout. Sulfonamide preparations and fever cure most cases of gonorrheal rheumatism. Suitable diet and hygiene can in large measure prevent exacerbations of gout. Colchicum and the dangerous cinchophen are almost specific in relieving the acute manifestations of gout.

The great group of nonspecific arthritides are helpfully classified by the American Rheumatism Association according to the constitution of the patients, the changes in the joints and the clinical propensities of the joint disease into atrophic and hypertrophic types.

Atrophic arthritis predominately afflicts youth and young adults of the asthentic, Stiller or ptotic constitution. The predisposed type of individual tends to be tall, thin, narrow faced, long-necked, low in energy. His extremities are long and the musculature is sparse. The blood pressure is usually low. Such patients are chronically fatigued. They are prone to upper respiratory infections. They were formerly classed as "phthisical" because of their long, narrow chests.

Chronic arthritis peculiar to this asthenic type of person tends to anchylose in grotesque positions leading to the synonym of arthritis deformans. It is commonest in women. The small joints are predisposed. It often starts in the fingers progressively implicating the wrists, ankles, feet and elbows. Feeding is often difficult due to anchylosis of the jaw joint. The symmetry of its progress is striking. The soft tissues attached to the skeleton participate in the deforming process. The muscles atrophy. Contractures appear. The periarticular tendons and

---

Given at the 2nd District Post Graduate Conference, La-Salle, 1940.

ligaments and joint capsules thicken. Even in a bed-fast victim x-ray may show no intra-articular pathology. The cartilaginous surfaces may be quite smooth. Excess of synovial fluid leads to swelling of the joint, often fusiform. This may fluctuate. Then the x-ray shows an increase of joint space. Later destruction of cartilage and of the specific serous secreting membrane, the synovium, causes the joint space to appear narrow. The destruction of cartilage may be circumscribed leading to a punched-out appearance of the joint surface. Coincidentally the bones lose calcium becoming increasing transparent. This type of arthritis may selectively attack the spine producing the poker back or Struempell-Marie deformity. An additional, painful complication of the spinal type is the radiculitis expressing itself as sciatic, intercostal or brachial neuralgia.

The patient with atrophic arthritis wastes, looks and feels sick. Anemia of the secondary, small-celled type develops. Appetite fails. A low-grade, septic fever is often present. The sedimentation time becomes rapid. We have found streptococci in the blood of many of such patients. This clinical picture has led to the name of chronic infectious arthritis. In children it is called Still's disease.

Treatment of these victims is analogous to that of another chronic infection, tuberculosis. To secure the best cooperation and prevent the migration of patients from doctor to doctor the patient with chronic, progressive, anchylosing, deforming arthritis must be given the proper perspective. He must be told that he will be sick for months, that recurrences and set-backs are part of the usual clinical course, that he should not expect too much from any one therapeutic procedure be it surgical as extraction of pulpless teeth; medical as the use of any new drug or type of injection; or physiotherapeutic as fever, massage or a light. He must be assured that he has a good chance to get well. With very few exceptions these patients can be truthfully promised marked benefit from meticulous care carried out for months. Those with rheumatoid characteristics preponderating (less tendency to anchylosis) are as likely to be cured or freed of symptoms as patients with peptic ulcer or such infections as tuberculosis or chronic gonorrhea.

The management involves foremost such hygienic measures as rest, definitely prescribed and sufficiently prolonged. In many instances complete temporary invalidism will have to be accepted as the shorter and ultimately cheapest road to recovery. Partial casts or splints may be needed to maintain rest of involved parts. Salicylates remain the most commonly used drugs for joint pains. Salicylates given as acetylsalicylic acid with calcium salts are demonstrably superior. For two years I have used a mixture of acetylsalicylic acid and calcium glutamate. In the stomach[1] this mixture forms the very soluble, active calcium acetylsalicylate. As contrasted with aspirin this does not irritate the gastrointestinal tract and gives prompter effect. It is usually well tolerated by patients intolerant to aspirin.

Dietary adjuncts as vitamins and calcium and phosphorus are important. The best diet seems to be one carrying an abundance of minerals, vitamins B, C and D and enough roughage to secure good bowel activity. Calories are sought in the fats rather than in carbohydrates. A high intake of meat and eggs is necessary to combat anemia and compensate for the rapid protein break-down. It is generally recognized that a generous protein intake increases resistance to any infection.

Physical therapy, supervised by a physician, is indispensable. Heat can be best applied locally with heat lamps or bakers. Hot compresses are especially valuable in the exacerbations. Contrast baths lend themselves to treatment of subacute or chronic arthritis of the extremities. Wax baths can be best utilized in treating the hands or feet. Fever therapy has proved of temporary benefit in a few stubborn cases.

Patients with atrophic arthritis tend to assume the posture of fatigue: kyphotic upper spine with winged scapulae, lordotic lower spine with protuberant abdomen, flat feet. They are coached in the postural exercises of Goldthwaite and Osgood and corrective foot exercises are stressed. Proper shoes are definitely prescribed and are adjusted to the patient's needs by soft felt padding.

---

1. Furnished by courtesy of Lakeside Laboratories, Milwaukee, Wis.

Diathermy is the most convenient and effective means of heating deep tissues. Short wave high frequency has practically replaced conventional diathermy. In my practice it is applied by means of the induction field utilizing a cable electrode.

Floundering in skepticism of procedures long regarded as helpful in some patients with arthritis but not curative in all, trying in vain to reduce treatment of disease to a physiological experiment, some writers discredit the most helpful doctrine ever advanced in the treatment of chronic arthritis, the theory of focal infection. While infected tissues have undoubtedly been removed without obtaining hoped-for improvement, Billings' and Rosenow's teachings have done more to reverse the progressive invalidism of chronic arthritis than any other suggestion thus far advanced. In spite of a tendency to belittle focal infections, removal of pulpless teeth in adults or tonsillectomy in more youthful patients results in recovery or improvement too frequently to be called coincidental. Perhaps the best evidence for the causal connection of infected foci has been the exacerbation or intensification of symptoms ensuing after inopportune surgical disturbance of suspected foci. To avoid this I permit tonsillectomy, tooth extraction, or prostatic massage only after the patient's general health has improved or joint manifestations have subsided.

Rejecting infection as one of the causes of chronic arthritis has led to abandoning vaccines in its treatment. I regard streptococcus vaccines properly made and intelligently used as an important aid in the recovery of that class of patients presenting findings characteristic of infection. Vaccines also may be used to prevent the exacerbations occurring after removal of infectious foci. Vaccine is injected subcutaneously in subreaction doses. I have found vaccine superior to other forms of foreign protein therapy.

I have never seen any improvement from sulphur or iodides. Change of climate has in my experience never resulted in any more benefit than would be expected from removing the patient from his responsibilities.

Gold therapy is undergoing a revival. It is my practice to reserve it for patients with an arthritis, predominantly atrophic, not responding to other measures. Its dangers are universally recognized. I have yet to see a patient respond favorably to gold injections, regardless of preparation used, after failing to benefit from the more commonly used, safer methods. It has seemed to me that the patients most improved by gold have been those with some evidence of liver damage resulting from the medication.

Careful x-ray treatment often relieves the symptoms of Marie-Struempell's disease, poker back or atrophic arthritis of the spine.

The patient with hypertrophic arthritis is usually past middle life. His constitution tends to be sthenic, robust. He boasts of never having been ill. He has often led a vigorous life. He tends to be overweight. His face is round, his complexion plethoric. His neck is thick and short. His chest is deep and round. His blood pressure is often elevated. Such patients have good appetites. They are commonly constipated.

Trauma plays an important role in the location of the joints involved by hypertrophic arthritis. Typists and pianists develop arthritic finger joints. Miners have arthritis of the spine. The obese patient has arthritis of the knees and lumbar spine. The Charcot joints of tabes are currently regarded as hypertrophic arthritis due to trauma.

In hypertrophic arthritis the arthropathy has a predilection for the large joints, often on one side. In the small joints hypertrophic arthritis is represented classically by Heberden's nodes in the terminal joints of women at the time of the climacteric.

The x-ray shows spurs and frequently narrowing of the joint space due to erosion of the cartilaginous plates.

Although the shafts of the patients' senile bones are often thin and brittle from osteoporosis the trabeculae about the joints are extra heavy. The cartilage is progressively eroded until finally the eburnated bone ends are approximated.

Bony overgrowth and muscular spasm due to pain may limit the motion of the osteoarthritic joints but true anchylosis, as seen in the atrophic type, never develops. Osteophytic growth and changes in alignment may result in very marked deformity. In this country arthritis deformans is atrophic arthritis. In England arthritis deformans is taken to mean hypertrophic or osteoarthritis. Because of the age of the patients, their well-nourished state, their plethora and

high blood pressure such patients have incorrectly been said to have gout. This incorrect diagnosis has erroneously raised the incidence of gout.

Joints afflicated with hypertrophic arthritis have to be protected against trauma. With this in mind the obese patients must reduce weight. Many of them are women in the menopause leading to the designation menopausal arthritis. These women irrespective of their basal metabolic readings frequently improve on thyroid. Estrogenic substances have failed consistently to benefit patients with arthritis. These substances, theelin and estradiol, have very effectively removed the arthralgic complaints of the climacteric. Only second to the metabolic approach is the effectiveness of physical therapy in hypertrophic arthritis. Reassurance that invalidism with deformity is unlikely is of great help in treating this type of arthritis.

A great group of patients present features common to the hypertrophic and to that subgroup of atrophic arthritis termed infectious. This motley, unclassified group actually embraces most patients with chronic arthritis. For sake of a better term their arthritis is said to be mixed although either the atrophic or hypertrophic characteristics predominate, marking the trend of the arthropathy. This mixed group requires a careful appraisal of the possibilities of the therapy used in the two great groups. Such patients have a better outlook for recovery than patients with classical atrophic or hypertrophic joint changes.

Fibrositis, a form of soft tissue rheumatism, involves most frequently the capsules of joints and the periarticular ligaments, bursas, tendons and fascia. It is a common complication of arthritis and like hypertrophic arthritis, affects especially overweight individuals past middle age. Lumbago is its commonest expression. Excluding arthritis, most pain about the neck and shoulder is due to fibrositis. Patients with arthritis frequently have the tender nodules of fibrositis about the sacroiliac joints. Fibrositis responds well to heat and massage. Recently we have used acetylcholine (Mecholyl) with the galvanic current in fibrositic patients with brilliant results.

The patient with chronic arthritis is statistically justified in maintaining a hopeful attitude regarding recovery or at least in expecting marked benefit by the use of known, accepted methods of treatment. Probably in arthritis more than in any other disease more effort has been made to remove empiricism from treatment. But, as in other diseases, treatment has preceded a wholly satisfactory explanation of its mode of action.

THE INJECTION TREATMENT OF HEMORRHOIDS*

HARRY E. BACON, M.D., F.A.C.S.†
PHILADELPHIA, PA.
AND
FRANCIS D. WOLFE, M.D.
CHICAGO

The injection treatment of hemorrhoids although limited in its field of usefulness is recognized as an adequate means of therapy in selected cases. Most of the contrary opinions are based on adverse results which sometimes occur, such as recurrence, sloughing, abscess and fistulae. These have been eliminated to a great extent by perfection of technic, but the greatest factor in obtaining satisfactory results is the proper and discriminating selection of cases. The great misfortune is that those not properly schooled in the anatomy of the anorectum and qualified in the technic are prone to inject hemorrhoids indiscriminately. Failure and complications follow incorrect diagnosis, non-observance of the contraindications and faulty technic. Strict adherence to every detail and utmost care must be exercised if one is to avoid disaster. According to Martin, approximately 50 percent of all the cases of internal hemorrhoids are suitable for injection treatment, but it is advisable that the patient understand definitely the merits and limitations of this form of therapy.

Hemorrhoids of the internal variety when small or of moderate size, and uncomplicated are suitable for the injection treatment. This form of treatment is contra-indicated in all external

*From the Department of Proctology, Temple University School of Medicine.
†Clinical Professor of Proctology, Temple University School of Medicine.

hemorrhoids, including skin tags; in the presence of marked fibrosis of the internal hemorrhoids; in complicated cases where inflammation and prolapse are marked, or in those which are thrombotic, strangulated or ulcerated; in the presence of associated pathology or a markedly contracted sphincter muscle.

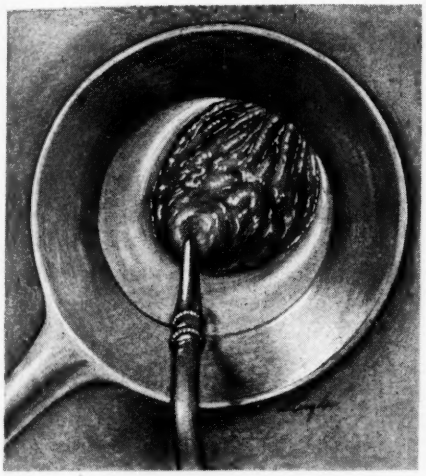


Figure 1. Proctoscopic view of internal hemorrhoid. The needle has been inserted in the submucosa.

The purpose of the injection treatment is to shrink the pile mass by obliterating the varicosities with fibrous tissue through the deposition of some sclerosing solution into the submucosa immediately overlying the hemorrhoidal veins.

The selection of a sclerosing fluid is important in the injection of internal hemorrhoids. Quinine and urea hydrochloride, 5 percent aqueous solution, and 5 percent phenol are standards which may be used with satisfaction. Sodium morrhuate, 5 percent in benzyl alcohol, may be injected if the patient has an idiosyncrasy to quinine, or during pregnancy when quinine would be contra-indicated. A comparative three year study of the effect of solutions of phenol and those of quinine and urea hydrochloride discloses that the results were more satisfactory with the latter, for which reason we employ it routinely.

The armanentarium necessary for this treatment is a suitable anoscope, syringe, and needle, sclerosing solution, and good light. We use routinely the anoscope designed by C. F. Martin and find it excellent for this purpose. Any type of syringe may be employed for this injection treatment provided it meets the necessary requirements and can be conveniently handled by the operator. Either a tuberculin or the ordinary Luer syringe is suitable for this purpose, especially since standard needles can be attached. A 24 or 25 gauge needle of medium bevel is preferable. In all cases good illumination is essential whether it be direct or indirect.

Technic. No preliminary preparation of the patient is necessary. With the patient in the left lateral position, the upper cheek of the buttocks is held by the patient or an assistant and the well lubricated gloved finger inserted into the anus. A few circular movements with the finger before the speculum is introduced, tends not only to moisten thoroughly the anal canal and partially relax the sphincter, but to assist in gaining the confidence of the patient. The speculum is smeared with a water-soluble lubricant and gently inserted in a rotary manner. Ordinarily this is accomplished more readily if the patient will strain or bear down. After the hemorrhoidal tissue is exposed, carefully inspected and the most prominent pile selected for the injection, the surface is wiped clean with a dry cotton applicator and painted with gentian violet 1 percent solution. The needle is inserted into the upper portion of the pile mass for a distance of approximately ⅛ to ¼ inch. It is important to introduce the tip of the needle into the submucosa and not into the vein. The plunger is slowly pressed until 8 to 12 minims of the quinine and urea hydrochloride solution are injected or until slight ballooning takes place. The surface should appear blanched or ischemic. When a sufficient quantity of the solution has been injected, the speculum and needle are withdrawn simultaneously. It is unwise to re-insert the instrument once it has been withdrawn.

There should be no pain at the time of, or following the injection, although a sensation of fullness occurs infrequently. The most common cause of pain is making the injection too close to the anorectal line; so that, should any discomfort take place during the insertion of the needle it should be immediately withdrawn and re-inserted at a higher level. By rotating the speculum, with the tip of the instrument well above this line of junction, the injection can be

made painlessly. A burning discomfort ofttimes occurs following the injection of too large an amount of the solution.

It is of the utmost importance that the hemorrhoids be treated at regular intervals and not in a haphazard fashion; ordinarily all cases are injected twice weekly without interruption. The number of injections required is determined by the number of hemorrhoids present and their response to treatment. It is customary to inject one hemorrhoid at each visit. When they are of small size, however, we do not hesitate to make additional injections, especially if the patient resides at a distance, making frequent visits inconvenient. As an average it may be said that each hemorrhoid requires from two to four injections, so that a total of six to sixteen constitutes a course. Usually at this time the hemorrhoidal masses will have disappeared. Accurate record must be kept as to the site of the injection as well as the amount of solution administered and the date of each injection.

No specific treatment is required following the injection, although the patient is advised to avoid severe physical strain on the day the treatment is administered. Liquid petrolatum, ½ to 1 ounce by mouth is prescribed night and morning during the course of the treatment. A daily evacuation is essential during the course of treatment but drastic purgatives are to be avoided. The regular diet is permitted.

The advantage of this form of treatment is the fact that no pain, either during or following the injection accompanies this procedure, if properly performed. The method requires no anesthetic and is more economical for the patient. It is an ambulant procedure and therefore does not necessitate hospitalization.[1] This therapy can be employed without risk and can be utilized in pregnancy, diabetis and old age, as well as in cardiac, renal and pulmonary diseases.

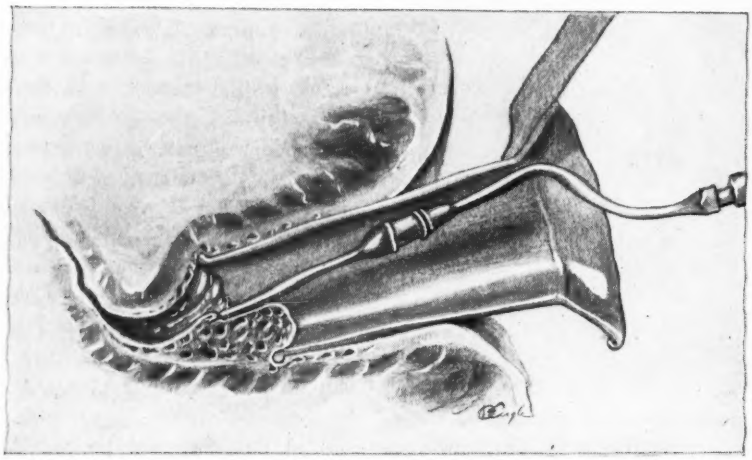


Figure 2. Sagittal view showing needle in the upper portion of the hemorrhoid, preparatory to injection of the sclerosing solution.

The disadvantages of the treatment is the frequency of recurrence in from two to five years.

Complications are comparatively rare in the hands of experienced operators, who carefully select their cases for treatment. In some instances a feeling of syncope may occur during or immediately after the injection, but such quickly subsides. At times a sensation of heat or slight fullness exists for a few minutes, but rarely does it continue for more than half an hour. Should pain or discomfort occur, the application of compresses wrung out in hot water, or a sitz bath 110° F. are very helpful.

In a small proportion of cases idiosyncrasy to quinine will be noted. This condition may be recognized by the appearance of generalized erythema, uticaria, impairment of vision, pallor, vertigo, deafness or blindness. In such cases, phenol or sodium morrhuate should be substituted in the future.

Marked bleeding never occurs unless sloughing takes place. In part, this may be avoided by withdrawing the speculum at the same time as the needle. This relieves the tension placed upon the pile mass by the tip of the anoscope and permits the rectal walls to collapse, which serves to exert slight pressure and thereby prevents bleeding. Sloughing is due to the use of too strong a solution or an excessive amount of solution, or to making the injection too close to the anorectal line. Sloughing may be treated by the instillation of warm olive oil or dichloramine-T. In some cases bleeding is not infrequent and pressure with a plug of vaseline gauze, or even ligating, may be necessary.

This form of therapy, when instituted by those properly schooled in the anatomy of the anorectal region and in the technic of administering the injection gives excellent and gratifying results. The importance of the proper selection of cases and sclerosing solution used must not be minimized. When the patient has a clear understanding of its value and limitations as a treatment and not a cure, the injection treatment of internal hemorrhoids becomes one of the most valuable assets in the armamentarium of a proctologist.

1527 W. Girard Ave., Phila.
30 N. Michigan Blvd., Illinois

Let us make every American strong, stronger than ever before, sturdier in body, steadier in nerves, surer in living. This is our job, not all of it, but a vital part. Harriet Elliott, Nat'l Defense Adv. Commission.

The boy who wears a clean shirt but has a dirty neck is in the position of hospitals which deny admission to known cases of tuberculosis. Hospitals which admit known cases of tuberculosis or realize that tuberculosis may be present and unrecognized, are being modern, logical and wise. They may then segregate the known cases and protect their personnel. They will be alert to case finding among the new admissions. W. H. Oatway, Jr., M.D., Hospitals, August, 1941.

THE TUBERCULIN TEST

SOL ROY ROSENTHAL, M.D.
CHICAGO

Tuberculin is a product of the tubercle bacillus, which when introduced into the skin of an individual who has had an experience with the tubercle bacillus, calls forth a delayed or bacterial type of reaction of the host. This is in contrast to the immediate or non-bacterial type of protein hypersensitivity. Numerous methods of preparing and administering tuberculin have been described, but only those which have proven to be most efficacious and practical will be the subject of this discussion.

Source of Tuberculin

a. Old Tuberculin (O.T.) Tubercle bacilli (human or bovine or both) are grown on a fluid media (peptone-glycerine broth) for from 6 to 8 weeks. These cultures are then concentrated on a steam bath to 1/10th of their original volume (the bacilli may or may not be filtered off before the boiling). The final filtrate, a dark brown, clear fluid, is the so-called concentrated old tuberculin (O.T.).

b. Purified Protein Derivative (P.P.D.). The method of preparation and concentration is similar to that above (the bacilli are grown on a synthetic media which eliminates the protein of the broth). Further concentration and purification is effected by subjecting the concentrated filtrate to ultrafiltration and precipitation of the protein by trichloracetic acid to remove the carbohydrate.

Methods of Administration

a. Intracutaneous (Mantoux). Old tuberculin or P.P.D. may be used, the desired amount of tuberculin being contained in 0.1 ml. of diluent. A special beveled shoulder needle, of 26 gauge and 3/16th inch cannula, plus a 1 cc. tuberculin syringe, is recommended. The injection must be made in the superficial layers of the skin and when properly executed leaves a 1 cm. in diameter bleb. The writer has ob-

---

From the Tice Laboratories, Research Department, Chicago Municipal Tuberculosis Sanitarium, and from The Department of Pathology, Bacteriology and Public Health, University of Illinois College of Medicine.

Presented before the Section on Public Health and Hygiene, 101st Annual Meeting Illinois State Medical Society, Chicago, May 20, 1941.

tained good blebs as follows: The barrel of the syringe is grasped with the thumb and index finger so that the head of the plunger rests in the palm of the hand. The syringe and needle are held tangentially to the inner aspect of the alcohol cleansed forearm. Because of the beveled shoulder of the needle, the point of the latter will touch the skin. By a gentle, forward, rocking, side to side motion, the point is engaged in the superficial layers of the skin until a little beyond the orifice is buried. Pressure is now gently exerted by the palm of the hand, obviating a change of position. Readings are taken 40 to 48 hours after the injection.

b. Percutaneous (Patch test — Vollmer). The patch consists of filter paper, impregnated with concentrated old tuberculin (two papers) and a broth control (one paper) held in place by adhesive tape. The interscapular region is ideally suited for this test, although the inner aspect of the forearm or the anterior chest wall may be used. When hair is present, shaving is necessary. The site is defatted with acetone or ether, and allowed to dry. The tape is then applied (removing the crenoline) and well massaged for at least 10 strokes. The palm of the hand is held against the tape for a few seconds to warm the adhesive. The tape should be removed in 48 hours and readings taken at 96 hours.

Reading of Reactions

a. Intradermal. An area of induration at least 10 mm. in one diameter (8 mm. for infants under 3 months) constitutes a positive reaction. Redness alone is considered negative. When the degree of induration is slight, stroking the site gently with the small finger and comparing with the opposite, non-injected forearm is often helpful. There have been many methods advocated for determining the size of the reaction, but the simplest and most practical is to measure the smallest and largest diameter of induration. The degree of reaction is arbitrary, beginning from one plus (+) when the induration is just perceptible to four plus when necrosis accompanies the lesion. Redness may also be measured and the intensity recorded (+ to ++++), but this is not important. At times, a halo of redness will surround the central site of induration (a reflex nervous phenomenon similar to that seen in histamine wheals). This zone should not be included in the measurement of the size of induration.

b. Percutaneous. The reaction is considered positive when several discrete to innumerable coalesced papulo-vesicles on the tuberculin site and none in the control area are found. Because the reaction at times extends beyond the site of tuberculin, the lesion is measured in two diameters. Whether there are few, many or innumerable papulo-vesicles is also recorded. It has been found in the main that severity of reaction of the patch test corresponds to that of the Mantoux. Some skins are sensitive to the adhesive tape, and papules may form but the site of the impregnated papers usually remains free. Occasionally papules are noted as a result of the control broth; such lesions are usually few in number, differ in character, and disappear by 96 hours.

When numerous papulo-vesicles are noted after 48 hours, the reaction may be considered positive provided the control area is free of lesions. A few vesicles at 48 hours have been noted to disappear after 2 days.

Dilution of Tuberculin to be Used

This depends upon the age of the individual, his environment (social and tuberculous) and clinical symptoms. Old tuberculin and purified protein derivative will be considered together, the equivalents being:

1st strength P.P.D. (.00002 mg.)=0=1:25,000 (.004 mg.) to 1:50,000 (.002 mg.) O.T.

2nd strength P.P.D. (.005 mg.) =0= 1:100 (1 mg.) to 1:200 (0.5 mg.) O.T.

a. Age. In routine private practice, with no known history of tuberculous exposure, the equivalent of 1 mg. O.T. (1:100 O.T. or 2nd strength P.P.D.) can be safely employed in children up to five years. From 5 years to 18 years, .02 mg. O.T. (1:5,000 O.T. or 2nd strength P.P.D. diluted 50 times), and from 18 years on, .004 mg. O.T. (1:25,000 or 2nd strength P.P.D.) are recommended as the first test dose. If the first test is negative, it should be repeated in 48 hours on the opposite arm, using 1 mg. O.T. or 2nd strength P.P.D. By following this procedure, second testings will be minimized and the number of severe reactions reduced.

b. Environment. For children living in crowded districts, especially in large cities, 1 mg. O.T. as the first test dose can be employed only up to 2 years of age with safety; otherwise, the same procedure as above should be followed to avoid severe reactions. This factor was clearly demonstrated by Tice in a tuberculosis survey of Chicago school children. With a history of exposure to tuberculosis, or for those whose profession places them in close contact with the tubercle bacillus (internes, nurses, doctors, orderlies, technicians and bacteriologists), the first test dose should be with .002 mg. O.T. (2nd strength P.P.D.) followed, if negative, by .02 mg. O.T. and finally 1 mg. O.T. or equivalent.

c. Clinical Symptoms. Suggestive of Tuberculosis. In all ages the first test dose should be .001 mg. O.T. (1:100,000 O.T. or 2nd strength P.P.D. diluted 2 times). Subsequent testing should be done with .02 mg. O.T. (1:5000) and finally 1 mg. O.T. or equivalent. Up to 10 mg. O.T. can be used if clinical symptoms justify it, but a control broth injection must also be made as the percentage of false positive reactions in this dilution is high.

Simple Technique of Diluting Tuberculin

Draw up O.T. in a 1 cc. tuberculin syringe to the 0.1 ml. mark and sterile distilled water or saline to the 1 ml. mark (1:10 dilution). Mix well in the syringe and pour out in sterile test tube until 0.1 ml. remains in syringe. Dilute as above to the 1 ml. mark (1:100). In this way any desired dilution may be had in the multiple of 10. Dilutions up to 1:100, kept on ice, will be fairly potent up to 1 month. Dilutions up to 1:10,000 may be used for 1 week. All other dilutions should be made up freshly. Dilutions of the first and second strength of P.P.D. may be made in a similar manner.

Choice of Test to be Used

In children the patch test is highly recommendable as a routine screening procedure. In a study made by the writer with Dr. Neiman, in children from 3 months to 4 years of age there was 94.2 per cent agreement between the two tests (1 to .01 mg. O.T. was used). Among the positive reactors (children who were vaccinated with the Bacillus of Calmette and Guerin, BCG), the agreement was 88.8 per cent, while among the negative reactors, it was 100 per cent. There were no false positive reactions following the patch test, as compared to at least 1 mg. of O.T. In the literature, good agreement has been reported in children up to 12 years of age. After this age, there is some difference of opinion.

With individuals living in a congested cosmopolitan area, or where there is known contact with tuberculosis, or when symptoms suggest a tuberculous infection, the Mantoux test is preferable as given above. The writer has seen more or less severe reactions with extensive vesiculation in patch tested children who were experiencing their primary tuberculous infection.

If there is good reason for expecting a positive tuberculin reaction, and the patch test is negative, a repeat test is advisable, as shall be discussed below. If the reaction still remains negative, a final test with 1 mg. of O.T. intradermally is recommended.

Value of the Tuberculin Test

Generally speaking, a positive test signifies that a tuberculous lesion, progressive, stationary or regressive, exists in the body. Because of our methods of isolation of tuberculous patients, ambulatory pneumonthorax, slaughtering of tuberculous cows, pasteurization of milk, and general public health education, the primary infection occurs later in life than formerly. Thus, a positive reaction during childhood and adolescence should be carefully evaluated by clinical and X-ray studies. In adults, a positive test is less significant, but warrants at least one X-ray of the chest.

When a recently negative reactor becomes positive, this signifies a current infection. Such a condition in early childhood warrants clinical and X-ray studies over a period of several years, and a search for the source of infection. In adults, similar studies should be made at least over a period of one year.

Aside from technical errors, such as poor tuberculin or faulty technique of injection, conditions exist in which, notwithstanding the presence of a tuberculous process in the body, the skin fails to respond to tuberculin. The most frequent of these are:

1. *Preallergic stage,* considered to be 3 to 8 weeks following the presence of tubercle bacilli in the host. In BCG vaccinated animals and

humans, the writer has found this time to be as little as 5 to 7 days.

2. *Malignant forms of tuberculosis,* such as tuberculous meningitis, miliary tuberculosis, and tuberculous pneumonia.

3. *Debilitating diseases,* resulting from any disease where the tissue turgor is poor.

4. *Following certain infectious diseases,* especially measles and whooping cough.

5. *Following a healed tuberculous primary infection.* In a certain percentage of cases, known positive reactors subsequently lose their hyper-reactivity.

Anamnestic Reaction to Tuberculin

Not infrequently a negative tuberculin reaction upon immediate retesting may become positive the *first test,* using the same dose of tuberculin and a different site. This is explained on the basis of an awakening of a dormant state of reactivity to tuberculin (Novak). Thus, the writer has found both with the patch test and with 1 mg. of O.T. that by repeating this test dose, a certain number of negative reactors become positive. In suspected cases, a repetition of the concentrated test dose should be considered.

EVOLUTION OF THE DIAGNOSIS AND TREATMENT OF CARDIOVASCULAR DISEASES

EMMET KEATING, M.D.
CHICAGO

If we compare the physicians of 1942 with the physicians of fifty and a hundred years ago, we find some resemblance to an effort to compare electric lights, paved roads and the speedy automobile to tallow candles, mud roads and the faithful horse. Tallow candles maintain their position as units of light. Cement has taken the place of mud but the roads run in the same direction and to the same places. The old family doctors who learned after years of experience how to appraise the emotional flurries and storms of the neurologically unstable live again in the persons of the psychologists and psychiatrists. The old family doctor boiled urine in a teaspoon to discover the presence of albumen, added a little yeast to the specimen and set the bottle near the stove for a certain number of hours. If the cork blew out, the patient supposedly had diabetes. Now alert young women in laboratories, with chemical reagents, test tubes, microscopes and other mechanical aids, do promptly and accurately the simple tests the doctors of the past did so clumsily. The same young women make available to physicians in practice the information the pathologists, physiologists and physiological chemists have spent months and years in obtaining. Information available alike to the family doctor and to the specialist. But with all the modern, valuable and ofttimes necessary laboratory tests, the patient's tongue, the jaundiced eye and the mental condition continue to be reliable guides in the making of a diagnosis.

The encyclopedic number of changes in the bodies of patients suffering from chronic cardiovascular diseases are a challenge to the ability of the physician to make a comprehensive diagnosis and are a test of his ingenuity in treating these patients so that they may live with a relative amount of physical and mental comfort and work with a passable degree of efficiency. The awareness of, and intelligent appraisal of these changes by the attending physician is, in many seemingly hopeless cases, rewarded by the disappearance of distressing symptoms and the ability of the patients to carry on usefully within the threshold of their endurance.

The making of a comprehensive diagnosis is an outstanding example of the evolution of the practice of medicine. It means a partial return to the simple technique of the old-time doctor, plus the making of a permanent record of the history and findings.

When preventive medicine curtailed the occurrence of acute infections, a new type of medicine was born. The old-time doctor was able to tell the difference between tonsilitis and diphtheria, but carefully-made cultures often showed diphtheria bacilli in the throats of children suffering from a simple tonsilitis and the clinical diagnosis was branded unreliable.

The time-consuming work of obtaining a reliable history, the detailed study and recording of the description of the normal, and departure from the normal of all tissues and organs available to the scrutiny of the five senses is the initial step to the making of those laboratory

tests necessary to prove or disprove the clinical diagnosis and the avoidance of making tests that are unnecessary and add to the expense to the patient.

The consultants, appreciating the futility of death bed studies, were the first to practice the new type of medicine. The first attempt of the family doctor to practice modern medicine was to depend almost entirely upon laboratory findings in the making of a diagnosis, but he soon learned the shortcomings of that procedure and adopted the methods of the consultants. With the history, the physical findings and the laboratory reports before him, the physician can make a leisurely study of all the evidence and usually can make a diagnosis that cannot be successfully denied.

Evolution is a halting step behind any discovery. Evolution of the diagnosis and treatment of conditions detrimental to any tissue of the human body is dependent largely upon the evolution of the mental processes of the individual physician, the discovery of toxic agents, chemical and bacterial, and the invention of mechanical instruments and machines that aid in determining the one and administering the other.

We now have many mechanical aids that give proof of the occurrence of tissue changes as convincing and indisputable as Koch's four rules. The sphygmomanometer, the stethoscope and the ophthalmoscope are available to all physicians as bedside and office equipment that do not require long and special study for the interpretation of what they reveal. The electrocardiograph and X-ray machines confirm and add to the information gained from physical examination and the use of the simpler bedside equipment.

The study of the cardiovascular system began with the work of William Harvey who made known his discovery of the circulation of the blood in 1616. A century and a half passed before practicing physicians began to sense the significance of his careful and painstaking work. His discovery was the first step in developing the information that led the medical profession to understand the relation of the heart and the blood vessels to many symptoms, both subjective and objective, once considered disease entities. To the minds of many physicians of the 17th century, dropsy, cough, and those cases of jaundice due to aneurysms, bore no relation to cardiovascular disease.

Harvey's discovery was made about eight years before the birth of Thomas Sydenham, England's Osler of his day. In Sydenham's "Practice of Medicine," written in Latin in the latter part of the 18th century, there is no mention made of heart disease. He gives a lengthy discussion on the subject of dropsy, but says nothing of its relation to the heart and the vascular system.

In 1755 there appeared two small volumes entitled,

THE PRACTICE
OF
PHYSIC
FOUNDED ON PRINCIPLES IN
PHYSIOLOGY AND PATHOLOGY
HITHERTO UNAPPLIED IN
PHYSICAL INQUIRIES
John Shebbeare, Reg. Acad, Scient, Paris, Soc.

This forerunner of text books on physiology is a strange mixture of philosophical speculations and commendable experiments undertaken to discover the cause of the heart beat. Shebbeare, searching for the cause of the heart beat, used sharp pointed instruments and the electrical machines of that day to stimulate contractions on the animal heart. Not solving the problems by these experiments, Shebbeare decided to subscribe to the accepted belief that some mysterious force known as vital heat, acting through the blood stream, initiated the contractions of the auricles and ventricles. Clinically, he observed the hardening of the arteries and correctly surmised that the condition is due to changes in the vessel walls.

Auenbruegger, in 1761, published the result of his studies on the proper method of applying percussion as an aid to physical diagnosis. Although this method of adding to our diagnostic knowledge of the position and size of the heart and aorta has been supplanted by the accurate revelations of the fluoroscopic screen and film, percussion continues to be a measure of much value in both acute and chronic pathological conditions affecting the chest and abdomen. Perhaps its greatest claim to usefulness as a

forward step in the progress of the science of diagnosis of cardiovascular diseases is the fact that its application necessitated the baring of the patient's skin, which long after Auenbruegger's time was considered an indecent procedure.

Willian Heberden, in 1766, described for all time the symptoms of angina pectoris. Heberden states that after he had observed the symptoms in a number of patients he searched the literature for information on the condition but was not able to find any mention of the subject.

Benjamin Rush, one of the physicians who signed the Declaration of Independence, observed and wrote about the part played by the emotions and extra physical exertion on the integrity of the heart. He noted that many of the dead found on the battlefields of the American Revolution had not suffered from any wounds. He cites the case of the aged doorkeeper of the Continental Congress who dropped dead when news of the surrender of Cornwallis reached Philadelphia.

Lecturing in the time of the first Napoleon, Corvisart discusses pericarditis and carditis. He made post-mortem studies of patients who had suffered from those conditions, and cardiovascular changes were recognized as the cause of symptoms earlier physicians had considered disease entities.

Laennec, in 1816, made the first stethoscope out of paper. The advantage of this instrument over direct auscultation was at once appreciated and its use by physicians very soon became general, but such is the power of tradition that teachers in the medical schools in the closing years of the nineteenth century were discussing with the medical students the supposed advantages of direct auscultation over the use of the stethoscope. Laennec's discovery stimulated the search for knowledge of cardio-vascular diseases, but delayed the proper conception of heart disease by magnifying in the minds of physicians the importance of murmurs. Until, and after the MacKenzie awkening, teachers of internal medicine revelled in the study of murmurs. They made fine distinctions between the different types, their timing, and their supposed significance. They wrote voluminously and talked a great deal about the importance of presystolic, post-systolic, and pre and post-diastolic murmurs. The medical students were able to hear only a few of the murmurs that the professors described, but generously ascribed their inability to sense the time and character of the murmurs to their own lack of auditory acuity and mental ineptness.

In 1840, the first discovery of the conducting tissue in the heart was made by Purkinje, the indefatigable searcher for anatomical treasures. In considering the evolution of the diagnosis of heart disease, Purkinje, although he did not know the function of the cells that bear his name, deserves credit for starting the chain of events that led to our present knowledge of the mechanism of the heart beat. His discovery fanned the flame of curiosity in the minds of other investigators, a curiosity that led to the discovery of the bundle of His in 1893, the node of Tawarra in 1906, and the starting place for the contraction impulse of the normal heart, the sino-auriculo node, or the node of Keith and Flack, discovered in 1907. Thus was concluded the search for the origin of the heart beat begun by John Shebbeare one hundred and fifty years before.

In 1856 Kolliker and Muller made the discovery that when a frog's heart contracted it produced an electric current.

In 1887, Waller applied electrodes to the front and back of the chest, connected them with a capillary electrometer and succeeded in making some crude but inaccurate tracings.

MacKenzie, in 1892, fifty years after Purkinje's contribution, published studies of the cardiovascular system, that were a revelation to physicians of that period. MacKenzie placed murmurs in their proper role of importance and taught the medical profession to center its attention on the waning integrity of the heart muscle. He illustrated his conception of cardiovascular disease by recording arterial and venous tracings.

Roentgen published his studies relative to the penetration of X-rays in 1893. It was several years before roentgenologists, with improved machines, developed a technique for taking accurate pictures of the heart and aorta. The fluoroscope and films reveal both the geography and physiography of the thorax, the position and deformities of the heart and the aorta, and the increased pulsations indicating the presence of aneurysms. The film is a permanent record of some of the revelations of the fluoroscopic screen.

The next step in the progress toward correct diagnosis of heart pathology was the invention of the electro-cardiograph in 1903 by Einthoven, the Dutch physiologist. Einthoven persuaded Sir Thomas Lewis to attempt to determine the value of the electrocardiogram as an aid in the diagnosis of heart disease. Lewis and his associates devoted two years to experimental work on animals and clinical work on patients. The value and accuracy of the electrocardiogram was satisfactorily demonstrated. The original work done by Lewis has been repeated by many other workers and much has been added of diagnostic value. The electrocardiograph and the X-ray machine are complementary to each other and no heart examination is satisfactory or complete unless these mechanical aids have been used. In many cases they are of more importance in the establishment of a cardiovascular diagnosis than the sphygomanometer, stethoscope and ophthalmoscope. Einthoven demonstrated the making of phonocardiograms in 1907.

The most dramatic contribution to the diagnosis of heart disease was the chapter on coronary thrombosis, written by James B. Herrick in 1912. Herrick's discovery was the result of clinical and post-mortem studies.

One of the strange things in the history of medicine was the failure of the old-world physicians to connect the occluded coronary arteries, found at post-mortem, with this tragic disease. Doctor Herrick was the first physician in Chicago to own an electrocardiograph. He observed the characteristic curve of T_1, but, realizing that at that time the electrocardiogram was nothing more than a Chinese laundry ticket to the medical profession, failed to make his discovery known.

Pardee was the first student of the electrocardiogram to describe this curve in the medical literature and it has since been known as the Pardee curve.

Those interested in electrocardiography soon learned that there are many variations from the classical, first-recognized clinical symptoms of coronary thrombosis. The excruciating an devastating pain in the chest, which radiates to the arm or arms, causing the patient to thresh around in bed or walk about the room bitterly complaining of the continuous and distressing pain, is not the most common. We now know that some patients die quietly and suddenly with no evidence of any suffering. Some have moderate pain and air hunger and some have overshadowing abdominal symptoms that may completely deceive the puzzled physician. I have observed that radiation of the pain to throat or neck is often of more serious consequence than when the pain is referred to the arm or arms. The examining physician should inquire with most scrupulous care as to whether or not the pain is behind the sternum or is the frequently occurring precordial pain often due to gastrointestinal disturbance.

In considering the evolution of the diagnosis and treatment of cardiovascular disease, it has been amply proved that no mechanical aid replaces the careful history and painstaking physical examination that should always constitute the first steps in making a comprehensive diagnosis of cardiovascular disease. The recorded history, the result of the physical examination and the laboratory findings are the blueprints necessary to intelligent treatment of the cardiovascular patient whose useful days are to be prolonged.

TREATMENT

In the entire history of medicine the outstanding contribution to the treatment of cardiovascular diseases was the discovery of the effect of infectious diseases that so commonly are contracted by children. When this discovery was made it had to be sold to the general medical profession and in turn sold by them to a surprised and doubting public. Parents rebelled at a program of bed rest. The seeming absurdity (to them) of keeping a child in bed for three or four months and restricting its physical activities for three or four years, aroused their antagonism and temporarily injured the standing of the physician who advised a program of that kind. A large part of the public remains unconvinced and the future health of the rheumatic child is not properly safeguarded.

If in the treatment of cardiovascular diseases three conditions are kept in mind, the attending physician will be the better able to arrange his items of treatment and happier results will be obtained. These three conditions are the depressed heart, the overstimulated heart and the vascular supply to the body and to the heart

itself. In some cases no sharp line can be drawn between the depressed heart and the overstimulated heart. Modern treatment has the advantage of a better understanding by physicians of the effect of many factors that tend to increase the work of the heart and do injury to the blood vessels. Relief or amelioration of these unfavorable conditions will often eliminate the necessity of administering stimulating drugs to an overworked heart. Another advancement is the growing appreciation that an aortitis may simulate heart disease.

A better understanding of the action and limitations of digitalis contributes much to the proper treatment of heart disease. When edema is present digitalis is no longer considered the first remedy to relieve the over-burdened heart. In the light of our present knowledge of the physiology of the cardiovascular system, the past abuse of so valuable a drug as digitalis is becoming apparent to the entire medical profession. Except in those cases where fibrillation or flutter are factors with which the physician must reckon, it is doubtful if digitalis has any considerable place in the treatment of heart disease.

2800 Milwaukee Avenue

ENDOSCOPY IN THE DIAGNOSIS AND TREATMENT OF DISEASES OF THE CHEST

STANTON A. FRIEDBERG, M.D.
CHICAGO

Introduction. The term endoscopy may be applied to any examination involving instrumental inspection within an organ or particular body cavity. Bronchoscopy and esophagoscopy are thus but examples of a number of special procedures which included gastroscopy, peritoneoscopy, cystoscopy, sigmoidoscopy and others.

Just twenty-five years ago Dr. Friedberg, Sr. read a paper before this group entitled "Foreign Bodies in the Respiratory Tract."[1] At that time the removal of foreign bodies constituted the chief indication for bronchoscopy and esophagoscopy and the diagnostic possibilities of these methods were just beginning to be explored. Today the situation is reversed in that foreign body cases comprise but a small percentage of all patients seen and treated in bronchoscopic clinics while diagnosis and therapy account for the remainder. It has been repeatedly emphasized that the combined efforts of internist, roentgenologist, pathologist, bronchoscopist and surgeon are prerequisites for efficiency in this work. Realization of this has doubtless accounted for the increasing importance of bronchoesophagoscopy in the diagnosis and treatment of diseases of the chest. Furthermore, the rapid progress made by thoracic surgeons in recent years carries an added necessity for early accurate diagnosis of diseases previously considered hopeless but now definitely amenable to surgical eradication.

No discussion of this subject would be complete without tribute to Dr. Chevalier Jackson whose mechanical genius has been largely responsible for the instruments most widely used today and whose teachings have been spread to all parts of the world by many students who have been privileged to study with him.

TECHNIQUE

Local anesthesia, in the form of pontocain or larocain applied to mucous membrane surfaces, is most commonly used. Only in rare instances is general anesthesia employed. Children are usually examined without any anesthetic agent. Adults submitting to their first diagnostic procedure often have basal preparation consisting of a barbiturate compound plus morphine and scopolamine in dosages based upon the patient's size and physique. We feel that this allays apprehension and contributes to relaxation without producing any undesirable side effects.

The need for well-trained assistants and adequate equipment, as in any surgical technique, is second only in importance to the necessity for special training and experience on the part of the endoscopist.

LARYGNEAL AND TRACHEAL DISEASES

Without attempting to enumerate all of the various laryngeal and tracheal conditions encountered, it can be stated that a direct specular examination is indicated either as a diagnostic or therapeutic adjunct in the majority of cases in this group. One might cite the necessity for biopsy and for subglottic inspection of the larynx prior to laryngofissure or laryngectomy for car-

From the Department of Otolaryngology, Rush Medical College and Presbyterian Hospital. Read before Section on Eye, Ear, Nose & Throat, 101st Annual Meeting The Illinois State Medical Society, May 20, 1941, Chicago.

cinoma. In children, direct exposure of the larynx requires but a few seconds and is of the utmost importance, for instance, in infectious diseases where obstructive dyspnea demands immediate intubation or tracheotomy. Intubation may be contraindicated in marked laryngeal edema, or, if needed, may be performed easily under direct vision through the laryngoscope. A small bronchoscope or straightened "life-saver" tube passed into the trachea of an urgently-dyspneic individual provides a much-needed airway and an opportunity for an unhurried, carefully-executed tracheotomy. This technic has done much to eliminate the emergency factor in the average case of obstructive dyspnea. Tracheotomy openings may be utilized for the passage of a bronchoscope and the removal of crusts and inspissated secretion from the tracheobronchial tree.

G.S., aged 10, developed stridor, retraction of the accessory muscles of respiration, restlessness and cyanosis 24 hours after the onset of sore throat and fever. After direct inspection of the larynx and trachea a diagnosis of acute laryngotracheobronchitis was made. The bronchoscope was left in situ and tracheotomy performed. In three days the temperature was normal and the patient could breathe with the tracheotomy tube partially corked. Several days later a cough and fever developed and signs of consolidation were noted over the right lung field posteriorly. There was roentgen evidence suggesting atelectasis. Bronchoscopic examination through the tracheotomy opening revealed obstruction of the right lower lobe bronchial orifice by a mucus plug. This was aspirated, the temperature fell to normal and roentgenograms showed clearing of the chest. The tracheotomy tube was removed several days later and the boy was discharged from the hospital.

BRONCHOPULMONARY DISEASES

Diagnostic bronchoscopy is indicated in almost all forms of pulmonary suppuration, in suspected foreign bodies, when uncontaminated cultures are desired, for biopsy purposes, in most cases of asthma, in instances of unexplained cough, hemoptysis, atelectasis or obstructive emphysema and in some forms of pulmonary tuberculosis. Care must be taken however, not to allow enthusiasm to obscure surgical judgment in the choice of patients. Moribund individuals, patients with greatly impaired vital capacity, (due to multiple abscesses or long-standing pulmonary fibrosis) with advanced cardiovascular disease, aortic aneurysm, acute exudative tuberculosis or recent severe pulmonary hemorrhage should not be subjected to bronchoscopy except in the presence of foreign body.[2]

Bronchiectasis. Too often the patient with bronchiectasis is denied the benefit of available diagnostic methods. Every bronchoscopist knows that bronchiectasis may be the result of an unrecognized foreign body. Bronchoscopy may be useful in removing obstructive granulations and this should always be done prior to lipiodal instillation for accurate mapping and localization of the diseased segments. Many patients report at intervals for bronchoscopic aspiration and the symptomatic relief thereby afforded.

K.K. aged 25, had been troubled by a cough productive of 12-14 ounces of foul sputum daily for many years. Lipiodal instillation was carried out, each lung being studied separately on antero-posterior and lateral views. The bronchiectasis was localized to the left lower pulmonary lobe, with only a trace of dilatation in one or two branches on the right side. Lobectomy was decided upon and performed by Dr. J. M. Dorsey.

The roentgen ray may be misleading and diagnosis established only by bronchoscopy.

J.H. aged 65, had been having a productive cough and recurrent hemoptysis for 3 years. The roentgenographic diagnosis was bronchiogenic carcinoma and a course of roentgen therapy had been given without any change in symptoms or roentgen findings. Bronchoscopy and bronchography proved the lesion to be bronchiectasis. The patient has remained symptom free for one year with occasional bronchoscopic drainage. Obviously the diagnosis of carcinoma cannot be considered accurate without positive microscopic evidence.

Asthma. Opinions vary as to the therapeutic value of bronchoscopy in bronchial asthma. Aspiration of secretions, removal of uncontaminated specimens for bacteriological study and preparation of vaccines certainly warrant a trial. More important, however, is the diagnostic aspect of this condition. For wheezing respiration is not only characteristic of asthma but may be due to bronchial stenosis, neoplasm, granulation tissue or foreign body.[3] We feel that every asthmatic patient is entitled to diagnostic bronchoscopy.

Pulmonary Abscess. The role of bronchoscopy in this condition is well-established but it should be remembered that the possibilities of effecting a cure by bronchoscopy alone decreases with the chronicity of the process. The best results are observed in cases where bronchoscopic drainage has been instituted immediately after the onset of symptoms.

Here again it is important to exclude other conditions which may simulate lung abscess roentgenologically or to which an abscess may be secondary. Of several such cases seen recently, two proved to be bronchiogenic carcinoma.

Postoperative Pulmonary Complications. Postoperative pneumonia was formerly a rather common diagnosis. We know now that many of these cases are actually due to atelectasis or its sequelae. Prompt bronchoscopic aspiration will usually restore ventilation in atelectasis and is of diagnostic and therapeutic value in other complications.[4]

R.S. aged 20, had an operation for undescended testicle, ethylene anesthesia being used. On the following day cough and signs of left lung consolidation appeared. The usual methods of postural changes and carbon dioxide-oxygen inhalations were employed with only slight benefit for 24 hours. At the end of a 48 hour period the patient's temperature reached 103 F., consolidation was still present and the sputum, previously mucoid, was becoming purulent. At this point the plea of the bronchoscopist was heeded. After thorough aspiration of a large quantity of mucopurulent secretion from the left bronchus, the patient's condition improved and subsequent recovery was uneventful.

Neoplasms. There has been a striking increase in the incidence of bronchiogenic carcinoma in the past thirty years. Whether the increase is actual or relative is a disputed question but the fact remains that roughly ten per cent of all deaths due to malignancy are caused by primary lung tumors.[5] Cough, the most constant initial symptom, is so commonplace that it does not receive just recognition. Hemoptysis is often disregarded when tuberculosis bacilli cannot be found in the sputum. Roentgen evidence of pulmonary pathology appears only after bronchial obstruction takes place or hilar metastases occur. Removal of neoplasms of the lung with permanent cure is no longer speculative but, as Graham has recently shown, more than 80 per cent of the patients are permitted to progress beyond surgical help before being seen by a thoracic surgeon.[6] This lack of earlier diagnoses is indeed regrettable when one considers that 75 per cent of bronchial neoplasms are within the endoscopic field of visualization. A positive biopsy is prerequisite to surgery in these cases although exploratory thoractomy should be considered in the same manner as is exploratory laparotomy.

C.G. aged 64, had had cough and purulent sputum for 4 months following thrombophlebitis. Roentgenogram was indefinite but suggested an abscess in the right upper pulmonary lobe. On bronchoscopic examination a minute projection of tissue was removed from the upper lobe orifice and found to contain carcinoma cells. In routine examination for metastases an area of rarefaction was noted in the skull. Surgery was contraindicated but on autopsy examination 5 months later the neoplasm was found sharply limited to the right upper lobe and had not even involved the trachea.

In addition to carcinoma, the so-called benign adenomas constitute an important clinical group since these lesions are clinically malignant in their effect.

Miscellaneous Conditions. Fungus diseases of the lung are subject to bronchoscopic diagnosis and treatment. Myerson has recently outlined the pathologic sequence of events in tracheobronchial tuberculosis and has demonstrated the important role of bronchoscopy in connection with tuberculosis therapy.[7] Bronchoscopic aspiration will occasionally yield positive evidence of tuberculosis when routine sputum examinations are negative.

Bronchography. The accurate mapping of lung segments by roentgenograms after the instillation of iodized oil is an important adjunct to bronchoscopy. We prefer to introduce the solution through the bronchoscope in children or, in adults, through a catheter previously passed into the larynx. This is carried out in a fluroscopic room where the position of the patient can be varied in order to fill any desired lobe and where "spot" films may be taken. Only one lung at a time is investigated, 8 to 10 cc. of oil being used. After completion of fluoroscopic introduction and study, routine antero-posterior and lateral chest films are made. If the oil reaches both lungs, the details of the important lateral view will be obscured.

The oil is usually coughed up immediately thereafter by the patient and no ill-effects have been experienced from its use in diagnostic procedures.

ESOPHAGEAL DISEASE

In diseases of the esophagus the two most significant objective diagnostic methods are roentgen ray examination and esophagoscopy. The latter should precede any form of therapy and eliminates any need for dangerous and unscientific blind bouginage.

Anomalies. Congenital malformation involving the trachea and esophagus are accessible to diagnostic endoscopy. The prognosis in cases of congenital atresia is poor. Congenital short esophagus associated with thoracic stomach should be studied carefully and may require treatment for stenosis, biopsy for confirmation or suspected malignancy.

Stricture. Accidents and suicidal attempts still account for many instances of esophageal stricture. Esophagoscopy may be performed after acute symptoms have subsided in any effort to prevent stricture formation. Once a stricture has formed, much care and perseverance is required to restore a patent lumen. Dilatations from above will often suffice but if a gastrostomy has been necessary, retrograde dilatations may be necessary.

P.O. aged 5, had a gastrostomy performed at the age of 2 because of esophageal stenosis following the ingestion of lye. When first seen at the age of 4, only a minute stream of thin barium passed into the stomach. Her nutrition was excellent due to a perfectly-functioning gastrostomy. A bougie could not be passed into the strictured area from above.

Under biplane fluoroscopy an esophagoscope was introduced through the mouth and another through the gastrostomy opening. The instruments almost met but fibrous tissue separated their tips. No lumen could be found and filiform bougies could not be passed through a stricture which seemed analogous to a prone S. Because dye by mouth could be recovered from the stomach, it was deemed inadvisable to attempt forceful penetration of the stricture. After almost a year of effort, we finally succeeded in getting a minute string through the stricture. This was recovered through the gastrostomy and retrograde dilatations were begun. The patient has now had permanent closure of the gastrostomy.

Cardiospasm. Since roentgenograms of this condition may be mistaken for malignancy or stricture and vice versa, direct inspection of the esophagus is always indicated in lesions which produce swallowing dysfunction.

Diverticula. Inspection of pulsion diverticular sacs for neoplasm, aspiration prior to surgery as well as actual esophagoscopic demonstration of the pouch and its attachment during surgical removal are now routine procedures. Traction diverticula are usually asymptomatic and require no treatment.

Neoplasms. Benign lesions of the esophagus can often be removed through the esophagoscope. In malignant lesions the problem is comparable to bronchiogenic carcinoma in that the disease is frequently advanced before diagnosis is made. In carcinoma of the esophagus, thoracic surgery has changed the previously-hopeless outlook. Unfortunately the esophagoscope is too seldom employed for early diagnosis, and "functional dysphagia" and "globus hystericus" are still used to designate conditions which eventually prove to be organic in nature. Routine esophagoscopy in all patients with dysphagia shares an importance equal to routine bronchoscopy for unexplained cough if further progress in the cure of early thoracic cancer is to be anticipated.

Miscellaneous. Tuberculosis, syphilis, leukoplakia and varices may be revealed by direct inspection of the esophagus. A method for endoscopic treatment of varices by injection of sclerosing solution has recently been proposed.[8] In addition, laryngeal, pulmonary and mediastinal diseases may produce esophageal symptoms by extension or compression. Complete diagnoses may be influential in the determination of therapy and prognosis of extra-esophageal lesions.

CONCLUSIONS

1. Direct examination of the larynx, trachea, bronchi and esophagus is indispensable for accurate diagnosis.

2. Endoscopic procedures frequently offer the most practical and effective therapy in certain diseases of the chest.

3. Routine endoscopic examination for obscure cough and dysphagia is necessary for early diagnosis if progress in the cure of thoracic malignancy by surgery is to be anticipated.

122 South Michigan Avenue.

REFERENCES

1. Friedberg, S. A., Sr.: Foreign Bodies in the Respiratory Tract, Ill. Med. Journ. Sept., 1915.
2. Graham, E. A., Singer, J. J. and Ballon, H. C.: Surgical Diseases of the Chest, Philadelphia, Lea and Febiger, 1935, p. 518.
3. Jackson, C. L.: Bronchoscopy in the Treatment of Pulmonary Disease, Int. Clinics, Vol. 2, Series 41, p. 154.
4. Jackson, C. and Jackson, C. L.: Bronchoscopical Observations on Post-Operative Pulmonary Complications, Ann. Surg. 97: 516-527, (April) 1933.
5. Overholt, R. H. and Rumel, W. R.: Clinical Studies of Primary Carcinoma of the Lung, J.A.M.A., 114: 735-742, (March 2) 1940.
6. Graham, E. A.: Bronchiogenic Carcinoma, A Plea for Earlier Recognition, Lahey Birthday Vol.: pp. 199-202, 1940.
7. Myerson, M. C.: Tuberculosis of the Trachea and Bronchus, J.A.M.A. 116: 1611-1615 (April 12) 1941.
8. Walters, W., Moersch, H. J., and McKinnon, D.: Bleeding Esophageal Varices, Arch. Surg. 41: 1101-1117, Nov. 1940.

DISCUSSION

Dr. John M. Dorsey, Chicago: I would like to commend Dr. Friedberg on his presentation of this subject to you. I think it is a very important one — very important from the standpoint of the thoracic surgeon, and I am sure it is important to you men who are interested in the subject as a specialty and who are able to do so much in increasing the use of the endoscope in the various problems to which it contributes.

I should like to emphasize the use of the endoscope and its value to the surgeon in the care of pharygoesophageal diverticulum. It aids particularly in visualization of the sac.

Secondly, bronchoscopy is of great value postoperatively, particularly in the treatment of postoperative massive collapse, of which Dr. Friedberg spoke. It should be used earlier. It can be done with very little trouble in good hands and there should be no fear or hesitancy in advising it. I am sure you will all concur in that.

The problem from the standpoint of thoracic surgery, in which I am most interested, is the cancer problem. Bronchiogenic carcinoma in the past has been felt to be a relative rarity. Recently, however, in statistics from the City Hospital in New Orleans, Ochsner and DeBakey have shown this to be one of the most common cancers. That throws a new light on the problem. There are two steps in arriving at a diagnosis. The first is to suspect it. I am afraid our records in the past as detectives have been poor because often, when diagnosis has been made, the lesion has been so far advanced that therapy is of no value. The second step is obtaining conclusive evidence through bronchoscopic biopsy. I would like to go on record as advocating bronchoscopy early in the investigation of any thoracic symptoms, particularly tightness in the chest, wheezing, coughing, etc.

I would like to show some slides to emphasize what has been said. Seventy-five per cent of cancers of the bronchi are found in the main division of the bronchial tree well within the scope of examination. The surgical mortality of Graham and Blades was 37 per cent. It must be remembered that the medical mortality is 100 percent, and for that reason we should be alert to recommend the only successful therapy we have — surgical resection.

Dr. Stanton A. Friedberg, Chicago (closing): I want to thank Dr. Dorsey for his discussion. He is the thoracic surgeon with whom most of this work has been done. I should also like to reemphasize the importance of early cough in bronchiogenic carcinoma. Too often, questioning of the patients reveals that their cough had been present for six or seven months. Then, as shown on the slides, the lesion is too far advanced for any consideration of surgery. The fact that over eighty per cent of these patients present inoperable lesions when first seen makes it imperative that earlier diagnoses be made.

ELECTRICALLY INDUCED CONVULSIONS FOR THE TREATMENT OF THE FUNCTIONAL PSYCHOSES

J. V. Edlin, M.D.
CHICAGO

Since the introduction of insulin and metrazol as therapeutic agents in the treatment of functional mental disorders, there has been an ever widening field of search for that therapy which will bring a maximum percentage of recoveries with a minimum of body damage.

Several differences in the treatment have been devised in order to obviate the undesirable effects of metrazol. Bennett[1] with curare, Low[2] with picrotoxin, the author[3] with scopolamine and others with various devices for the limitation of motion. Despite the unpleasantness and the complications which occur with this therapy, many administer it because they believe that the percentage of recoveries are noticeably higher than the percentage of spontaneous remissions.

In 1938, Cerletti and Bini[4] reported that electrical currents applied to the head brought about an immediate loss of consciousness and that a convulsion followed in from two to four seconds. They further reported that the patients had no recollection of their experience and that the state of excitation frequently observed with metrazol was absent.

Fleming, Golla and Walter[5] applied the electrical therapy and stated that the chief advantage for electrical shock over metrazol was the instantaneous loss of consciousness and an absence of surgical complications such as dislocations.

A. Von Braunmühl[6] believes that the immediate loss of consciousness prevents unpleasant sensations and mentions the advantage of not having to puncture veins. He believes that the treatments, if given prophylactically every year or two, may prevent relapses and that experiences, heretofore, have proved it harmless. F. E. Fox[7] also mentions "maintenance" shocks so that remissions may be prolonged indefinitely. Bingel and Meggenderfer,[8] Sogliani and Giorgio,[9] do not observe any material difference in

From the Chicago State Hospital, Edward F. Dombrowski, M.D., Managing Officer.
Presented before the Physicians' Association, Department of Public Welfare, State of Illinois, 101st Annual Meeting, Illinois State Medical Society, Chicago, May 20, 1941.

the incidents of complications with the two methods. L. Kalinowsky,[10] originally thought that electrically induced convulsions might cause cerebral damage but later in his "more shocks" withdrew it. D. Bair,[11] has cited two cases of vertebral fractures and Gonda,[12] mentions a fracture of both humeri in one of his patients.

The Machine: — The author uses the Offner Electric Shock Therapy Aparatus. It contains a number of provisions necessary to insure the proper value of treatment current. The patient's resistance is first determined by a high frequency (7,000 cycle) "test" current. Offner claims that the high frequency has been found necessary to eliminate the effect of the tissue polarizability which gave rise to the variability in the current supplied by earlier instruments.

A relatively high resistance (500 ohms) is inserted in the patient circuit. This tends to "swamp out" any small changes in the patient's resistance, maintaining the current at the desired value. An over-current relay is inserted in the patient circuit. This terminates the treatment if the applied current exceeds the desired value.

The treatment cannot be given until the "test" current has first been applied, giving a reading of the treatment current to be given. Another safety feature is the treatment switch, which not only controls the timer, but also the treatment current directly. Thus, if the timer should fail during a treatment, the current will not be given except as long as the switch is depressed. This will prevent the possibility of the occurrence of a serious accident from such a failure as may occur with some other machines.

Offner believes that the control of current, rather than voltage, is distinctly advantageous, in that it is necessarily the former, rather than latter of itself, that provides the treatment. Thus, whereas two patients may require the same treatment current to obtain convulsions, the thicker skull and skin of one may mean that the higher voltage will be required to obtain this current than with the other. This factor is automatically compensated by the test circuit in the machine.

Technique: — The patient receives no breakfast on Monday and Thursday of each week. One hour before electrical therapy is administered, he is given 1/100 of scopolamine by hypo and put to bed. When it is his turn he is led into the treatment room by an attendant. (The patients at the Chicago State Hospital have been treated with and without scopolamine on several occasions and the author is of the opinion that the patient is more cooperative and less apprehensive although the apprehension is slight, when the sedation is used). The patient is placed in a supine position on a therapy bed which is covered by a rubber sheet. Instead of the conventional spring, this bed has nothing but boards under the mattress. A small pillow is placed under the patients back approximately between the ninth thoracic to the third lumbar vertebrae. The attendant in charge of the patient's head, rubs saline jelly over the temples which have previously been clipped of its hair and applies the electrodes in their respective positions by means of an elastic band such as one uses on an electrocardiogram machine. The electrodes are 1¼ x 1¼ inches square. One attendant wearing rubber gloves, although rubber gloves do not appear necessary, applies pressure on both knees to prevent flexion and abduction. Two attendants fold the patient's arms across his chest so that one wrist rests upon the other directly over the sternum. Pressure is then applied over the head of the humerus in order to prevent dislocation. (And with the prevention of dislocations, the author has not encoutered any fractures). The pressure should be directed in such fashion that the force is always pushing the head of the humerus directly towards the opposite head. Both attendants then apply pressure on the wrist against the sternum. Because the treatment bed has boards instead of a spring, there is no give and acute flexion of the spine which has already been somewhat limited by the pillow under the back, is still further lessened by the manuel fixation. Spinal fractures are, therefore, almost eliminated. (Ten patients picked at random from the treatment group show no fractures). Prior to the press of the electrical treatment button, the attendant inserts a rubber protector between the teeth so as to protect the lips, teeth and tongue. He has been trained to grasp the chin when the electrical circuit is broken and to apply pressure

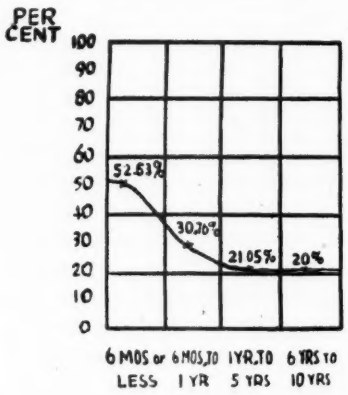
in that direction which will keep the mouth closed. In several seconds, this pressure is no longer needed but because the pressure was applied early, subluxation of the temperomandibular joint becomes a rarity.

The Convulsion: — The milleamperage necessary to produce a convulsion has consistently been between 350 to 500. The time duration, .5 of a second. Young adults will rarely have a petit mal attack with the above dosage but patients over 45 years of age frequently require not only the 500 milleamperes, but the time duration may have to be increased to .7 or 1. second. The petit mal attack, electrically induced, differs from the sub-minimol dose of metrazol. There is no confused struggle of a terror stricken patient but rather a brief loss of consciousness characterized by cessation of respiration which lasts from seconds to a full minute. During this state, the patient may make many swallowing motions. When the patient takes his first breath, consciousness returns.

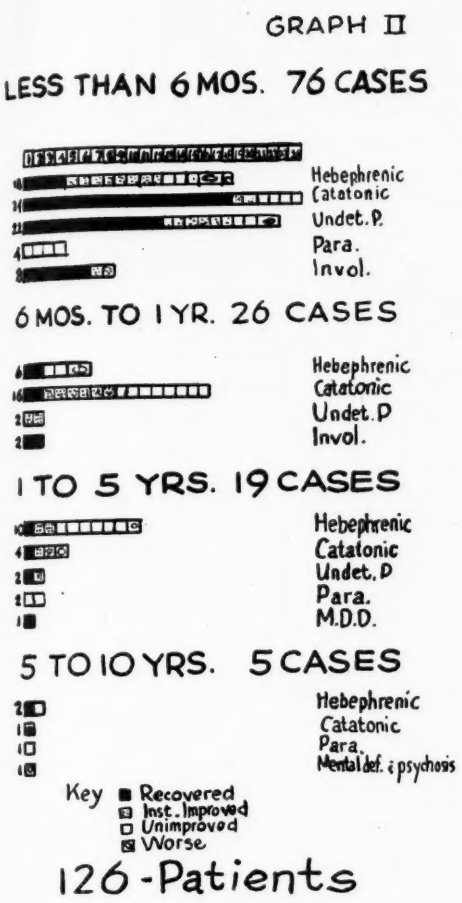
When a convulsion is induced, consciousness is lost with the press of the treatment button. The patient has a cough or expiratory cry and instead of a short clonic phase as with metrazol, immediately goes into a tonic state. Typical clonic convulsions follow the tonic seizure and differs from idiopathic epilepsy only in that the seizure induced electrically, appears to be much more severe. With the instantaneous loss of consciousness and the tonic surge, the mouth begins to open but it is held in check by the attendant. At the same time, there is a conjugate deviation of the pupils upwards and to the right or the left. As the clonic convulsion reaches the point of termination, the patient becomes progressively more cyanotic. This is followed by a brief apnea and then deep inspiratory action. The patient remains unconscious for three to ten minutes and then is confused from several minutes to hours. This confusional state which simulates a memory defect, appears to last much longer in some patients than with metrazol. One patient, a pharmacist, described the confusion by telling the author that "each attack seems to produce an amnesia". At the termination of the convulsion, respiratory failure appeared to be imminent in two patients who had a prolonged apnea, but they resumed their respiration without the aid of stimulants or artificial respiration.

GRAPH I

PER CENT RECOVERIES OF ALL CASES TREATED



Results: — One hundred and twenty-six patients received electrical convulsive therapy. The onset of their psychosis ranged from less than 6 months to 10 years and included all of the functional psychosis with the exception of manic-depressive manic, there being no patients of this type available during therapy. Graph 1 is self-explanatory. Patients who were mentally ill for less than 6 months, showed a 52.63% recovery rate. Patients from 6 months to one year, showed 30.76%, patients from 1 to five years, 21.05% and 6 to ten years, showed 20%. It is strikingly noticeable in Graph II that the greatest percentage of the recoveries were shown by patients suffering from involutional melancholia. Eight out of ten made a complete recovery. The next group showing the largest percentage of recoveries were catatonics. Out of twenty-four patients having a mental illness of less than 6 months, eighteen recovered, two were institutionally improved and four showed no improvement. With eighteen hebephrenics mentally ill less than 6 months, four



recovered, six showed institutional improvement, four were not improved and four appeared to be definitely worse than they were prior to the electrical therapy. Twenty-two patients mentally ill for less than 6 months and classified as dementia praecox, undetermined in type, because of combined hebephrenic and catatonic features, showed twelve recoveries, six institutional improvements, two unimproved and two who appeared worse than they were prior to the beginning of electrical therapy. Four paranoid patients were treated and none showed improvement. Of those twenty-six patients who were ill 6 months to 1 year, the following results are noted: six hebephrenics showed two recoveries, two unimproved and two were worse. Of sixteen catatonics, two recovered, six were institutionally improved and eight showed no improvement. Two undetermined types of dementia praecox showed two institutional improvements. Two cases of involutional melancholia, both recovered. Those ill 1 to 5 years, nineteen cases, give the following: ten hebephrenics; one recovery, two institutional improvements, six unimproved, one worse. Catatonic, four cases; one recovery, two institutional improvements, one worse. Dementia praecox, undertermined type, two cases; one recovery, one institutionally improved. Two cases of dementia praecox, paranoid in type; unimproved. One maniac depressive, depressed; recovered. From 5 to 10 years, five cases: two hebephrenics; one recovered, one unimproved. One catatonic; worse. One paranoid; no improvement. One mental defective with psychoses; worse.

The results indicate, as with metrazol and insulin, that the duration of a psychoses is important from a prognostic point of view. Those receiving therapy during the early stages, show the highest percentage of recoveries. The author recommends that patients suffering from dementia praecox, paranoid in type and hebephrenic, should receive insulin.

Comments: — Ten patients picked at random, received electrocardiograms before and after the treatment. All ten were normal prior to therapy. Immediately after therapy was discontinued, six were still normal, two showed some left ventricular preponderance, one auricular hypertrophy with heart muscle damage, and one damage to the bundle of His. Two patients having suggestive incipient pulmonary tuberculosis to auscaltation and perscussion, showed a definite increase in lung findings, one month after therapy was discontinued. Several acutely disturbed catatonics who had received massive sedation in the hydro-therapy department, were given electrical treatments and convulsions were easily obtained by increasing the amperage by 50. Two patients prior to therapy had old healed fractures, one a healed fracture of the humerus and the other a healed fracture of an elbow with ankylosis. Both patients received treatment with particular care for fixation and no new fractures occured.

Patients having appendicial scars or mid-line incisions or other surgical scars should have pressure applied during treatment because of the

terrific pull by the muscles during the tonic and clonic state during the treatment. The author finds it necessary to increase the milleamperage from the usual 400 in young adults to 500 in patients 45 years of age or over, and at times the time limit from .5 seconds to 1. second because it is more difficult to produce convulsions in an older person. Four patients who recovered with 10 treatments and then relapsed in from one to two weeks, were again given electrical therapy. They recovered with three or four treatments but again relapsed within a week. The therapy was re-instituted with a resultant recovery after a few treatments and then another relapse. Treatment was discontinued and two of the patients were worse than they were prior to the administration of the electrical therapy. Three patients classified as involutional melancholia were given electrical treatments after failings had been sent to the relatives because it appeared that they might die from exhaustion during the course of the psychoses. All three were very poor physical risks. Two recovered and one was institutionally improved. In over one thousand treatments, the author has never encountered what appeared to be a true respiratory failure. On two occasions, the patients were markedly cyanotic and had an apnea for a longer period than the others but with no stimulation by drugs or artificial respiration, they again resumed their breathing. The author detected arrhythmia in several of the patients immediately after therapy but the pulse was normal within one hour. Patients receiving electrical therapy showed a memory defect or a confusional state for a much longer period of time than the author noticed with metrazol therapy. At times, the confusional state was overtly noticeable for three weeks after therapy had been discontinued. Ten patients picked at random, received x-rays of the spine before and after treatment. No fractures were noticed after treatment. The author, however, is of the opinion that the same care in fixation is needed for electrical therapy as with metrazol therapy, particularly during the first surge that occurs with the press of the treatment button. Fully one-third of the patients receiving electrical therapy and improving to the point of where they were in excellent contact, frequently asked the author when their treatments would be terminated. They stated that they would not object to the continuation but at the same time said that it was unpleasant in some undescribable fashion. Although rubber gloves and clipping of the hair do not appear necesssary, one patient was given therapy with hair unclipped at the request of the relatives with a resultant jagged blue flame that swept down from her temple to her chin. Nothing happened, but the author was left with the impression that if any precautions for safety can be taken, they should be taken.

CONCLUSION

The percentage of recoveries in involutional melancholia, dementia praecox, catatonic, and dementia praecox, undetermined in type, definitely appear to be higher than the percentages noted with spontaneous remissions. Although the group of patients classified as dementia praecox, hebephrenic in type and paranoid was small, the results were sufficiently discouraging as to warrant the author's recommendation that they be placed on insulin therapy. The author recommends electrical therapy in preference to metrazol because of the percentage of recoveries in selected cases and the almost total absence of fear. The author believes, as does Victor L. Gonda,[12] that psychotherapy is a necessary and vital adjunct to electrical therapy.

BIBLIOGRAPHY

1. A. E. Bennett: "Preventing Traumatic Complications in Convulsive Shock Therapy by Curare," J.A.M.A., 114: 322-324, January 27, 1940.
2. A. A. Low, E. MacDougall, E. Ross, M. Sachs & D. Levitin: "Further Experiences with Picrotoxin as a Convulsant in the Treatment of Mental Illnesses (A Method of Combining Picrotoxin with Metrazol)." Amer. Journal of Psychiatry, Vol. 97, No. 3, November, 1940.
3. J. V. Edlin & E. S. Klein: "An Improvement in Convulsive Therapy with Metrazol by Premedication with Scopolamine Hydrobromide," Amer. Journal of Psychiatry, Vol. 97, No. 2, September, 1940.
4. U. Cerletti & L. Bini: "Electroshock Treatment," Boll. Acad. Med. Rom. 64: 36, May, 1938.
5. Fleming, G. W. T. H.: "Electrically Induced Convulsions," Proc. Royal Soc. Med., London, 33: 265-267, March, 1940.
6. A. VonBraunmühl: "Electrical Convulsions in Psychiatry," Münchener Medizinische Wochenschrift, Munich, 87: 501-524, May 10, 1940.
7. F. E. Fox: "Clinical Experience in Electrically Induced Convulsions," British Medical Journal, London, 1: 799-838, May 18, 1940.
8. Bingel & Meggendorfer: "F. Ueber Die Ersten Deutschen Versuche Einer Elektrokrampfbehandlumg," der Geisteskrankheiten Psichiatneurol Wchnschr, 42: 41, February, 1940.
9. Sogliani, G.: "Eine neue Methode der Krampftherapie: die Elektroshocktherapie," Dtsch. Z. f. Nervenheilk, 149: 159-168, August, 1939.

10. L. Kalinowsky: "Electric Convulsion Therapy in Schizophrenia, Lancet 2: 1232-1233, December 9, 1939. "More Shocks," Editorial, Lancet 2: 1373, December, 1939.
11. D. Bair, cites 2 cases of vertebral fractures, British M.J., 1: 104-106, January 20, 1940.
12. Victor E. Gonda: "Treatment of Mental Disorders with Electrically Induced Convulsions," Diseases of the Nervous System, Vol. 2, No. 3, March, 1941.

DISCUSSION

Dr. Lloyd H. Ziegler, Wauwatosa, Wisconsin: Dr. Edlin has given us a splendid brief account of the electric induction of grand mal as therapy for functional psychoses.

In medieval times mental patients were tortured in order that the Devil might be driven from them. Now we shock them into unconsciousness with the hope that they can be driven to better health.

Electricity has had an active part in medical science and art. The study of muscle-nerve preparations, and the reaction of degeneration are only a few well-known examples. Hitzig in 1874 used electricity to locate the motor area of the cerebral cortex. More to be remembered by all of us were the physician's offices outfitted with large static machines, the mysterious sparks from which were felt to be therapeutic in some unknown way. Such machines had scarcely disappeared before Cerletti and Bini in Italy had invented a machine (like the one described by Dr. Edlin) that would produce convulsions in man and animals by means of an electric current passed through the front half of the head. These workers were interested in the experimental production of epilepsy and it appears now that they were successful. Their work came at an opportune time to yield an interesting by-product of their research. Sakel had interested the medical profession of the entire world in the possible therapeutic effects of insulin therapy. And Meduna had noted that schizophrenics seldom have convulsions and therefore might respond to convulsive therapy. To induce convulsions he selected, from several that could have been used, a camphor-like substance, metrazol. (Paracelsus had used camphor to induce convulsions.) But metrazol proved much more valuable to depressed patients than to schizophrenics. Metrazol aroused great dread and fear in those to whom it was given. It tended to destroy veins. It was often difficult to give intravenously. Fractures and dislocations, and other complications, resulted from the convulsions. Some deaths were attributed to it. The electric method has largely overcome all of these objections, except the complications, which are being controlled by posture, belts, curare, and other methods. Therapeutically, electro-shock has no virtues that metrazol did not have.

The shock therapies are demonstrating what we had long known, that there is really no pure schizophrenia or affective disorder. Mixtures of human qualities exist in every psychiatric patient. Convulsive therapy reanimates a slowed up patient and tends to make depressive feelings disappear. It appears also to retard overactive patients and decreases their elation. It will not create emotions where few, if any, exist. It will not create energies in a person who has gradually receded to a low level of activity, or had never really been capable of activity. Shock in such patients gives only a temporary spurt.

We have given patients electro- and metrazol shock who have been known (by the encephalogram) to have cortical atrophy. They made only temporarily favorable responses on repeated trials. Whether maintenance or prophylactuc uses of electricity are practical is very questionable.

In the light of what I have said, Dr. Edlin's immediate results of treatment are understandable and correspond with other experience. A therapy such as this cannot be truly evaluated until 5 to 10 years have elapsed. If we disturb the inactive periods of life too much it is difficult to know what may happen to the person years hence.

At the recent meeting of the American Psychiatric Association at Richmond, Virginia, the round table on electric shock therapy was the most popular of all. To summarize briefly the points brought out there, I will say that thus far only 1 death has been reported. Animal experimentation with electro-shock has shown some glial nodules in the brains of sacrificed animals. These are not entirely convincing because the brains of animals are not really well known. Changes in the electro-encephalogram are known to occur and disappear slowly. Some few patients are known to be made temporarily slightly worse than they were by the treatment. It was felt that electro-shock is relatively safe in experienced hands. Curare is being used with it to spare the bones, joints, heart and blood vessels. And scopolamine does allay the anticipatory fear which is usually slight.

In conclusion, I wish to emphasize that electro-shock appears to be a valuable adjunct to therapy in that it hastens recovery in certain types of patients whose emotions or energies are not too damaged. Occupational, recreational, and psychotherapy are just as valuable as they have ever been to do the job of readjusting the patient as completely as possible. And education and habit training to fortify the integrity of growing youth seem, in the light of these newer treatments, to be more important than ever.

Dr. S. D. Klow, Jacksonville: Pertaining to the technique, when I was using Metrazol I avoided the situation where we got a petit mal convulsion and letting it stay at that. I found that the patients became worse mentally, so I repeated the injections and gave a larger injection and produced a grand mal and got good effects. Then with electric shock I did the same thing. I wonder if, when Dr. Edlin was doing this with the machine set at a certain amperage and only got a petit mal effect, whether he went ahead with a longer and higher interval and produced a grand mal. In connection with that, I wonder how often he dared repeat the convulsion at one treatment. I found sometimes that even the second did not in-

crease it enough and have given as many as three, and the highest — four. I personally found no bad results, although I did not check up with any electrocardiographic recordings to see if there was any damage.

I was surprised to hear him mention clipping the hair. I took a piece of gauze saturated with saline and applied it over the area where I had rubbed in the jelly, and put the electrodes over that. I never had any sparks, had no bad results, and avoided, particularly in women, the necessity of clipping the hair at the temples.

I never found it necessary to use scopolamine. The patients did not seem any more apprehensive than they would for the treatment of anything else you might try to do for them.

With Metrazol we did use the picrotoxin and had approximately the same results, except that with the injection treatment the patients were a little apprehensive about doing anything at all in the arm, and I found that the electric shock was much better. The majority of the patients did not even remember going into the room.

I think this is a very big factor in favor of the electric shock over Metrazol.

Discussion on paper of Dr. J. V. Edlin, "Electrically Induced Convulsions for the Treatment of the Functional Psychoses."

Dr. J. V. Edlin, Chicago, concluding: In response to Dr. Klow, when a patient received a petit mal, it all depended upon the classification and condition of the patient as to whether I decided to give that patient a grand mal immediately afterwards. If the patient was in a catatonic state and required tube feeding, I might. However, in a melancholia, the petit mal was sometimes sufficient to bring the patient out of a severe state of depression. I do not like to repeat the electrical therapy when I do not obtain the grand mal the first time because of previous experiences where some of the patients apparently got worse than they were prior to electrical therapy; and inasmuch as I do not know what is taking place in the brain, I am rather conservatively inclined about repetition.

With reference to scopolamine, it is a matter of choice. With the metrazol we had some aspirational pneumonias. The scopolamine seems to cut down on the salivation and lessen the hazard.

As regards prophylatic treatment, it would be ideal in a hospital that is as well staffed as his because the patients are also receiving trained psychotherapy, and it is psychotherapy that is so extremely necessary as an adjunct to maintaining that patient's drive. I feel that electrical therapy merely snaps them out. After that, it is up to the psychiatrist.

I appreciate the honor that Dr. Lloyd Ziegler has conferred upon me by discussing my paper.

THE PATHOLOGIST IN THE CANCER CLINIC AND IN THE HOSPITAL*

EDWIN F. HIRSCH, M.D.
CHICAGO

The Pathologist: The work relations in medical practice between the patient and his physician are relatively simple when the advice sought requires no considerable diagnostic effort. They become involved where a greater diagnostic study is demanded and the data obtained by physical examination are supplemented by clinical laboratory tests. Because of his training, a physician may choose to do some of these himself, or he may delegate them to a technical assistant under his supervision, or to a laboratory in charge of someone else.

When the disorder of a patient, in the opinion of his physician, demands the routine of a standard hospital, the services of an organized laboratory are available. My discussion concerns only the work relations of such an organization in the practice of medicine because they may be duplicated by commercial laboratories. The standard hospital laboratory is organized under the supervision of a physician — a graduate of a recognized medical school and with special training in pathology and preferably also in chemistry and bacteriology. He then, in the group relations, is the clinical pathologist. His training, if well rounded and with a background of clinical experience as intern or resident, will give him a sympathetic understanding of the problems confronting the doctors and their patients. He also will have some appreciation of the application of the art of the practice of medicine which as clinical pathologist may not be a large part of his experience since he deals, more often, directly with the attending physician and only indirectly with the patients.

The main responsibility of the clinical pathologist is to organize and maintain an efficient and accurate laboratory. The physical expanse of his domain and the size of his trained personnel are in proportion with the demands for

*From the Henry Baird Favill Laboratory of St. Luke's Hospital and the Department of Pathology of the University of Chicago, Chicago, Illinois.

Presented before the regular monthly meeting of the Perry County Medical Society, held at the Elk's Country Club, DuQuoin, on Thursday, October 2, 1941.

output. In some hospitals the interns complete the routine blood, urine, stomach, and stool examinations so that only the more technical procedures as in bacteriology, the chemistry of the blood, the serology and the tissue examinations are delegated to the laboratory force. In other hospitals, all of the work is assumed by a corps of laboratory workers. The clinical pathologist is responsible for the work of this group, and his organization should be developed so that from time to time he has personal checks of the laboratory tests made. The methods used, by their simplicity, should reduce to a minimum the element of human error or falsification.

While the pathologist is responsible for the entire routine work in the laboratory, his immediate participation in the procedures is in the diagnosis of surgical tissues and in the completion of postmortem examinations. His conclusions in all of these are reported to the attending physician and are recorded in the clinical records of the patients. The motive in the work of the pathologist is to determine and classify by tissue changes the disease present. Much of this is matching a composite of standard visual memory pictures against those seen in tissues. He resorts to all kinds of technical procedures, bacteriological examinations, and so on, to obtain data which will lead to a logical and correct diagnosis. The results obtained may confirm the clinical diagnosis of the attending physician; they may refute, or entirely replace the opinion expressed. In these functions the pathologist, having no or little direct contact with the patient, supplies diagnostic information which the attending physician may use with profit even though the disease, as determined by the tissue examination and in our understanding of medical practice, is considered hopeless.

These functions of determining the nature of disease by tissue examinations is basically associated with postmortem examinations — a thankless procedure perhaps, in the opinion of some, — and yet with a wealth of personal satisfaction to the close student of disease. The information gained, of course, has no practical benefit to the deceased: at least, it cannot restore life. But the attending physician is served in revealing to him the conditions in the body of his patient which he may have diagnosed correctly, may have suspected, or had no inkling of whatsoever. To the pathologist, in completing these examinations is the opportunity to determine the truth or fallacy of his own conclusions made during life. These multiplied in his experience and in the experience of others afford work standards against which his new tissues for diagnosis are matched.

The place of the hospital laboratory in medical practice, then, is to provide the attending physician with reliable results of so-called laboratory tests, and to the clinical pathologist is delegated the responsibility of executing this function.

I like to think of him as one steeped in the spirit of pure science because he must use so much of the basic subjects in his work; and that in the execution of his duties he develops into a forceful, modest laboratory diagnostitian giving to his professional colleagues the essentials in estabishing a correct diagnosis — the basis of proper treatment.

The Pathologist In The Cancer Clinic: The pathologist occupies an important position in the cancer diagnostic and treatment clinic, because with him rests the responsibility of tissue diagnosis. He must examine the tissues in the lesion and determine their nature. This, of course, directs the course of treatment which the surgeon and radiologist follow. The pathologist has no innate mystic power or endowed gift for his functions, simply because he is engaged in pathology as a special field of training. He must be trained and experienced just as the surgeons, the internists, and others are trained in their specialties. Presumptions on his part are as reprehensible as they are in other fields. The final diagnosis of a tissue embodies information that is derived from both gross and microscopic features. The proportion of each element in a diagnosis varies. In some, the gross appearance is of dominant value, and the microscopic structure is confirmatory; in others, the microscopic examination determines the diagnosis; and not infrequently both gross features and microscopic structure are equally important in the final conclusion. The diagnosis of a lesion, whether it is tumorous or non-tumorous, determines the direction of treatment. Clinicians, in evaluating

the nature of a nodule of the breast, by experience, develop and increase their diagnostic ability, but all admit that they have expressed only a tentative opinion, and that the final diagnosis depends upon a clear direct view of the tissues in the mass and a microscopic examination. This remark has no great import with large extensive carcinomas of the mammary gland which any physician will recognize at once. But medical practice today appreciates the limitations of surgery and radiology in the treatment of advanced cancer, and emphasizes the need of radical destruction or elimination of the growth in its initial or restricted stages. Destruction or removal of the cancerous growth at this stage affords the best hope of cure. In the evaluation of these tissues the pathologist functions.

The diagnostic service and the benefits to the patient are improved when the pathologist participates with the clinician in the physical examination of the patient. The pathologist obtains an understanding of the lesion as it confronts the clinician. This increases his fund of practical information and arouses a personal interest in the disease of the patient. His thinking processes, because he is a pathologist, take channels of thought different from those of the surgeon or other consultants. This proximity of the pathologist to the disease in the patient is important. There should be a minimum delay between the diagnosis and the initiation of proper treatment of any malignant growth. Having the facilities of tissue diagnosis in immediate proximity with the patient accomplishes what is widely recognized as good medical practice. In your mind, contrast the situation where a surgeon exposes a mass in the breast or elsewhere, has a diagnosis within a few minutes, and does all surgical treatment in one continuous procedure, with work conditions where a portion of the mass is excised and days after another operation must be undertaken. The pathologist also serves in the subsequent care of the patient. Nodules, suspected as recurrences or metastases, are submitted to him for examination and, finally, he is called upon to make the postmortem examination.

The Pathologist In The Hospital: The pathologist in the hospital renders an important service. In recent years the demands placed upon the clinical laboratory in hospitals have increased by leaps and bounds. Today the diagnosis and treatment of disease in patients in well-organized hospitals is accomplished and guided by numerous and varied clinical laboratory tests. Blood, urine, stomach, stool, and bacteriological examinations of all kinds, serological tests, and chemical analyses of the blood are made for these patients under the supervision of the pathologist. Often he is consulted in the laboratory to interpret the results of the tests, and not infrequently the diagnosis of the disorder in the patient is made by these examinations. The specific field in which the pathologist alone functions is in pathological anatomy. To him directly are delegated the examination of surgical tissues and the postmortem examinations. In many hospitals all tissues removed surgically are examined routinely. Reports of these examinations are prepared for the clinical records of the patients and for the permanent files of the hospital, and the sections are preserved for reference.

As the pathologist through daily experiences builds into himself tissue diagnostic ability and acumen and his work becomes coordinated with his professional associates, his position among his colleagues becomes that of a friendly counsel. They bring him their difficulties in diagnosis, the clinical histories of patients are reviewed in consultation, the surgeon seeks his opinion during surgical operations, and plans for further studies of patients are discussed. The postmortem examinations which the pathologist makes should be considered as educational: an opportunity for postgraduate instruction for the attending physician and staff. They provide also material for organized and instructive clinical pathological conferences.

The hospital and staff are obliged to support the pathologist. He should have the necessary equipment for the clinical laboratory and the laboratory should not be exploited for commercial gain. With work relations mutually promoted between the pathologist, staff and hospital, the medical practice of such a community rises to higher levels.

CARDIAC REVIEW OF 1940

NATHAN FLAXMAN, M.D.
CHICAGO

In the previous cardiac reviews[1-6] emphasis was placed on the clinical aspects of heart disease. This year, because of the war and the interest in defense preparations, there has been a drastic curtailment in the number of articles on the heart and its disturbances. The cardiac literature of 1940 was heavy on the use of sulfanilamide and its derivatives in all forms and phases of bacterial endocarditis; on hypertension, especially in association with a possible renal factor; and, as of recent years, a vast preponderance of material on all aspects of a very important subject — coronary artery disease.

1. SYMPTOMS AND SIGNS

The clinical interpretation of symptoms and signs of heart disease has been neglected in recent years, which Weiss[7] maintains is attested by the lack of adequate discussion in the literature, including textbooks. Bloomfield[8] stated that dysphagia may occur in connection with the following disorders of the heart and aorta; dilated left auricle, pericarditis, saccular aneurysm, dissecting aneurysm, and anomalous aortic arch.

2. METHODS OF CARDIOVASCULAR EXAMINATION

Electrocardiography.—All electrocardiograms should be made with the subject in the reclining position, according to Ylvisaker and Kirkland,[9] for not only would this eliminate the possibility of making certain diagnostic errors, but the heart rates would be slower and this would tend to diminish the S-T and T-P distortion. Sigler[10] stated that the electrocardiogram does not usually show characteristic changes after exercise that could be taken to indicate the presence of coronary insufficiency. This is also the opinion of Riseman et al,[11] for some subjects without heart disease may show changes similar to those which occur in some patients with angina pectoris, whereas other patients with angina may fail to develop appreciable changes following the same amount of work. Stewart et al[12] stated that in pulmonary infarction certain patterns occur in the form of the four leads of the electrocardiogram which appear to be characteristic of the lesion; the changes appear shortly after the occurrence of infarction and are detected by taking serial tracings, as alterations are transient and may disappear in a few days. The diagnosis of pulmonary embolism, as it appears to Sokolow et al,[13] must rest on an awareness of the possibility, and the suspicion that it may be present when atypical electrocardiographic features which superficially resemble coronary occlusion are noted.

Roentgenography.—The method, described by Robb and Steinberg,[14] of visualizing the chambers of the heart, the pulmonary circulation and the great blood vessels in man consists of two parts: (1) rapid intravenous injection of enough radiopaque material (solution of diotrast, 70%) to make the interior of the heart and of the thoracic blood vessels opaque to the roentgen ray, and (2) rentgenography of these structures at the time of their opacification.

3. ETIOLOGY OF HEART DISEASE

Congenital.—Tinney[15] presented two cases of interauricular septal defect, both in males, and stated that the only way to be sure of a correct diagnosis is by roentgen or fluroscopic examination as there are four characteristic features: increased hilar shadows, great enlargement of the right side of the heart, a small aortic knob, and a very large pulmonary conus. Gitlow and Sommer[16] reported the case of a 45 year old male with complete coarctation of the aorta, together with a bicuspid aortic valve and aortic stenosis of the Moenckeberg type, yet the history indicated that the collateral circulation had been perfectly adequate as actual impairment of the aortic outflow did not occur until after the developement of stenosis of the aortic valve. Benjamin et al[17] cited the case of an 18 year old girl with persistent ostium atrioventricular commune in a heart which functioned as a biloculate organ, with a history that extended over 11 of the 18 years of life. Joger[18] reported the case of a 55 year old woman who was admitted to the hospital following an attack of severe abdominal pain; she expired on the 9th hospital day and an autopsy disclosed embolic occlusion

Associate in Medicine, Loyola University Medical School. Associate Attending Physician, Cook County Hospital.

Note: This manuscript was originally submitted for publication on January 6, 1941, but was unfortunately misplaced. A duplicate copy was re-submitted on October 25, 1941.

of the superior mesenteric artery; the embolus arose from fragments coming from a recently non-infected thrombus in a patent ductus arteriosus.

Rheumatic.—From a clinical study of 81 young patients who acquired the physical signs of pure mitral stenosis, Walsh and his co-workers[19] showed that: (1) the evolution of the physical signs prior to the establishment of this deformity required in the majority from 5 to 15 years; (2) a relatively mild form of rheumatic fever appears to favor the developement of this particular lesion; and (3) the prolonged course of the disease in most patients with this deformity is fundamentally dependent on a benign type of rheumatic fever. Sosman[20] stated that mitral stenosis can be diagnosed frequently by careful roentgen examination as the demonstration of a calcified mitral valve is unequivocal evidence and dilatation of the left auricle without general cardiac enlargement is highly presumptive evidence. After follow-up periods averaging 7 years, Brown and Wolff[21] found that 50% of a group of 175 patients with acute rheumatic fever showed no evidence of heart disease; there was no constant relation between the severity of the illness or the number of recurrences and the deevlopement of cardiac damage. Boas and Ellenberg[22] gave large doses of salicylates to bring about prompt relief in acute rheumatic pericarditis with effusion; and there results a rapid reduction in the pulse rate and a resorption of the pericardial exudate with quick relief of dyspnea and toxemia. Clawson[23] analyzed 796 cases of rheumatic heart disease and found that, as a rule, patients with acute rheumatic endocarditis die, not during an attack, but later, from the effects of valvular stenosis and insufficiency. Hedley[24] reported that among 324 cases of bacterial endocarditis, 64.5% were regarded as superimposed on rheumatic heart disease.

Bacterial.—According to Major[25] sulfanilamide compounds show, in some instances, a fall of temperature to normal and the disappearance of the organisms in the blood stream of patients with endocarditis lenta. Heyman[26] reported a well established case of subacute bacterial endocarditis, in a 38 year old female, 18 months after recovery due to successful treatment with sulfanilamide; small doses of the drug were given over a period of 6 months. Lippmann[27] reported the recovery of a case of bacterial endocarditis closely following the administration of a total of 585 grains of sulfanilamide orally and 30 cc. of ammonium heptenchlorarsonate, in 1cc. and 2cc. doses of a 1% solution, intravenously. Christie[28] detailed a case of endocarditis in a 17 year old female with chronic foci of infection, chorea, hematuria, petechiae, organic heart murmur, splenomegaly, progressive pallor and weight loss, and two blood cultures positive for *Strep. viridans*, who is apparently cured with sulfanilamide; following large doses (120 grains daily) for 14 days, the patient became afebrile, had 4 negative blood cultures and showed steady improvement and no remission in a year's observation period. Steele[29] stated that sulfanilamide therapy had no effect on the general course of 13 cases of subacute bacterial endocarditis. The Alexanders[30] reported the cure of a case of acute ulcerative endocarditis in a 62 year old male following the moderate dosage of sulfanilamide over a prolonged period of time. Bayles and Lewis[31] found subacute bacterial endocarditis in older people (41 to 72 years) to be associated with pre-existing or chronic heart disease, but the clinical features of the endocarditis are essentially the same as those in younger patients but less accentuated. In a proved case of subacute bacterial endocarditis Kleiber[32] gave sulfapyridine and heparin, and the blood cultures were temporarily rendered sterile; severe hematuria necessitated the cessation of treatment. Fishkin and Pilot[33] reported a case in a 14 year old girl of tricuspid endocarditis due to Type I pneumococcus complicating pneumonia and mediastinal empyema; sulfapyridine temporarily cleared the blood stream of the organisms but did not prevent the fatal outcome. Braunstein and Townsend[34] stated that a bacterial endocarditis superimposed on a syphilitic aortic valvulitis may be suspected when in the presence of an aortic insufficiency, a gradually progressive anemia exists with slight daily intermittent rises in temperature which cannot be expained by other observations. Boyd[35] added that the clinical diagnosis of this association is at best difficult, but it should be suspected in any case of supposed syphilitic aortic insufficiency with a continuous febrile and progressively downhill course. At the Cook County Hospital, according to Rosenberg,[36] during the 10 year period from 1929 to 1938, 228 cases of bacterial endocarditis (31, acute; 197, subacute)

were observed among a total of 11,666 cases in which necropsy was done; of these, in 5 (1, acute; 4, subacute) the disease had developed on syphilitic aortic valves.

Syphilitic.—Kampmeier and Combs[37] studied the records of 163 patients with syphilitic aortic insufficiency in order to determine the part antisyphilitic treatment played in prolonging life, and felt that their study did not indicate that adequate therapy has a favorable influence on the prognosis of this lesion.

Thyroid.—Pemberton and Miller[39] believe that for a complete conception of cardiac physiology in relation to the hyperthyroid states the condition must be thought of in terms of altered, increased metabolism; and that a certain degree of cardiovascular disturbance is almost invariably associated with thyrotoxicosis. They stated that the most common disorder of cardiac rhythm is auricular fibrillation, and its persistence following thyroidectomy is suggestive of the presence of associated primary cardiac disease, residual cardiac injury from protracted hyperthyroidism, or recurrent hyperthydoidism of exopthalmic goiter.

Hypertension.—From the study of 243 cases of arrythmia among 800 hypertensive hearts, Flaxman[40] noted that auricular fibrillation was the most common arrythmia as it occurred in 198 (81.5%) of the patients; it had the best prognosis except in cases in which the fibrillation preceded and precipitated congestive heart failure. Arrythmia may occur at any time during the course of hypertensive heart disease and often is the first indication of cardiac involvement. In their studies on hypertensive heart disease, Davis and Klainer[41] found that patients with essential hypertension have more coronary atherosclerosis than patients without hypertension, a difference particularly striking before the age of 50. They[42] offered evidence to show that, although the incidence of coronary atherosclerosis in patients with essential hypertension is relatively high, hypertension, per se, is not the cause of this high incidence. In a study of 200 cases of hypertensive heart disease Garvin[43] found 14 in which a diastolic murmur was heard at the base of the heart; at autopsy the hearts in these cases were dilated but showed perfectly normal valves, and the pathological findings permitted no other conclusion than that the aortic insufficiency noted in life was functional and not due to anatomical changes in the valve leaflets.

Pulmonary.—In a review of 20 years of personal experience, White[44] stated that pulmonary embolism and infarction are easily overlooked, especially in the presence of congestive heart failure, when they are most common; or they are erroneously diagnosed as something else, especially pneumonia, congestive heart failure, or coronary thrombosis. Clues to the diagnosis lie in the occurrence of unexplained fever, leukocytosis, tachycardia, faintness, prostration, dyspnea, or even jaundice (from hemolysis of the infarct plus an engorged liver) especially in a cardiac patient (and particularly in the presence of mitral stenosis or heart failure).

Coronary.—From extensive clinical and pathological studies Blumgart et al[45] noted that obstruction of the normal coronary arterial flow by arteriosclerotic narrowing or occlusion regularly results in the developement of intercoronary anastomoses; the developement of which is not related to age, and such circulation may so well compensate for occlusion or marked narrowing of a major coronary artery that the blood supply to the heart remains adequate for ordinary activities of life. Shohet et al[46] stated that coronary disease causes a definite and progressive increase in the total heart weight. Horn and Finkelstein[47] studied 100 hearts which at necropsy showed evidence of recent occlusion of the coronary arteries either by thrombosis or by massive hemorrhage into their walls or both; arteriosclerosis was observed in every instance in which a partial or complete arterial occlusion was found, so that from a morphologic analysis, coronary occlusion is an incident in arteriosclerosis. Smith[48] pointed out that the rate of the formation of the coronary obstruction determines in a large measure the extent of the collateral circulation, the histologic changes in the myocardium, the efficiency of the heart, and quite probably the character of the clinical expression. Blumenthal and Reisinger[49] stated that attacks of cardiac pain other than angina of effort may precede the typical manifestations of coronary occlusion. Steincrohn[50] observed that the pain of an attack of coronary thrombosis may be compared with the pain of a number of attacks of angina pectoris which follow one another closely, but the pain and the rest intervals in

coronary thrombosis differ from these only in that the pains are more severe in the former and are unrelated to exertion. In a study of 375 cases of myocardial infarction, Pollard and Harvill[51] found 17 instances (4.5%) of undoubted coronary occlusion in which no pain, substernal pressure, or other "anginal" symptoms had occurred at any time; among the symptoms which occurred at the time of the accident in the 17 cases, the most common were dyspnea, nausea, and vomiting, dizziness, and fainting or collapse. Boland[52] reported that the administration of oxygen in high concentration serves as an efficient method of relieving the intense pain which may accompany acute coronary thrombosis. Strauss[53] cited five cases in which the diagnosis of coronary occlusion was clear clinically from the start, but the electrocardiograms showed changes only after a lag of several days. Master and Dack[54] stated that an attack of acute coronary occlusion is not sufficient reason for permanent disability; but resulting heart failure or a severe anginal syndrome is evidence of complete disability. The development of persistent pain in one or both shoulders is a relatively common sequel to myocardial infarction, according to Ernstene and Kinell,[55] and the severity of the condition ranges from the clinical picture of typical periarthritis with intense pain and great limitation of motion to one of mild aching pain with a sensation of weakness but without loss of function.

Pregnancy.—Among 22,837 patients with full-term and premature deliveries observed during 6½ years, Oppel[56] reported that 620 cases were complicated by organic heart disease, and congestive heart failure occurred in 25 (4%). Sodeman[57] pointed out cardiac abnormalities in patients who had apparently normal hearts before they became pregnant, and divided these cases into three groups: (1) physiologic changes, which are important to recognize in order to prevent unnecessary obstetric procedures and to avoid needless restrictions on the activity of such patients in the last trimester; (2) in the course of hypertensive toxemias of pregnancy and acute hemorrhagic nephritis in the antepartum period, cardiac failure, which may be acute or chronic, left-sided or right-sided, may develop; and (3) cardiac failure may develop from 2 to 4 weeks postpartum in patients who have shown little or no evidence of heart failure antepartum. Jensen et al[58] studied 108 obstetric patients with cardiovascular disease, and related that there were no deaths among the patients with organic heart disease who followed instructions and received adequate care from the beginning of pregnancy. Flaxman[59] analyzed the life cardiac histories of 49 women with organic heart disease who delivered from 1 to 22 children (average 5 pregnancies) as compared with the histories of 41 nulliparous women with similar cardiac lesions, which revealed that there was little or no difference in the known duration of the heart condition, in the ages at the onset of myocardial failure, or in the ages at death; the heart lesions were recognized earlier in the parous women, mainly because of the pregnancies; and women with heart disease die early because of the natural evolution of the cardiac disturbances and not because of the childbearing.

Trauma.—In a full discussion of direct nonpenetrating injuries of the heart, Leinoff[60] stated that the diagnosis of traumatic heart damage depends upon: (a) the awareness of this clinical possibility, (b) history of a direct nonpenetrating injury to the chest, (c) a previous normal cardiovascular history, and (d) the appearance of signs and symptoms, or laboratory findings indicating heart damage and appearing in the great majority of cases immediately after the injury and persisting thereafter.

4. PATHOLOGY

Myocardial.—Strong and Munroe[61] collected 42 hearts weighing 750 grams or more from the autopsy material of two years and noted that hypertension was the important clinical factor in producing cardiac hypertrophy; chronic adhesive pericarditis was notable because of its infrequency. Brown and Evans[62] reported a case of cardiac rupture, in a 70 year old male, through a calcified myocardial infarct with the intermediate formation of a myocardial aneurysm; a bacteremia resulting from a perinephric abscess, with localization of the inflammatory process in the myocardial aneurysm, brought about this unusual event.

Endocardial and Valvular.—Contratto[63] stated that a person may have aortic stenosis for many years without cardiac symptoms, but when congestive failure does ensue, the duration of life is short. Cohen and co-workers[64] reported 9 cases of calcareous aortic stenosis and that the outstanding physical signs are the typical murmur, accompanied by a diminished second aortic sound and a palpable thrill in the aortic area; the stenotic aortic lesion is usually accompanied by atheromatous changes in the aorta and coronary arteries and at times calcific changes in the mitral valve and ring; the occurrence of sudden death is striking. From a comparative study of valvular calcifications in rheumatic and nonrheumatic heart disease Epstein[65] found that the presence of calcifications did not appreciably alter the prognosis, nor was there any relationship between the symptoms of heart failure of known cardiac disease and the presence of calcareous deposits.

Pericardial.—Heimann and Binder[66] reported that pericardial aspiration and pneumopericardium improve the prognosis in tuberculous pericarditis as far as the time of survival is concerned. Glenn[67] cited a case of constrictive pericaritis in a 46 year old male which resulted from a crushing injury to the chest 2 years before the onset of the fatal illness. Harrington and Barnes[68] reported that 3 cured patients presented the typical picture of Pick's disease and all had extensive calcification of the pericardium with constriction of the heart muscle; the results, after adequate removal of the constricting pericardium, exemplify the capability of the heart and liver to reestablish function if the damage has not been too great.

Vascular.—Holland and Bayley[69] reported 19 cases of dissecting aortic aneurysm and noted that the most characteristic feature is the sudden onset of severe thoracic or abdominal pain, which may remain confined to the trunk or may radiate to the lower extremities; a rapid extension of pain from the thorax to the abdomen, and thence to the thigh, is probably to be explained by rapid dissection of the media in these regions. For this reason, a severe attack of thoracic pain, followed almost immediately by a severe attack of abdominal pain, is a sequence highly suggestive of this lesion. The 3 cases reported by Weiss et al[70] are unusual, not only because the dissecting aneurysm was completely healed, but also because atherosclerosis was present in the new channel in the wall of the dissecting aneurysm; and in none of the cases did the existence of the double channeled aorta contribute to the death of the patient. In approximately 10% of the reported cases the aneurysm heals, is not the cause of death, and can be compatible with adequate functional capacity for years.

5. FUNCTIONAL DISORDERS

Congestive Failure; Use of Digitalis and Diuretics. Stewart and co-workers[71] stated that there is a marked decrease in the functional capacity of the heart as a pump in congestive failure as shown by the decrease in cardiac output per minute per square meter of body surface (cardiac index) and per beat; prolongation of the circulation time occurs, as also may a rise in venous pressure, and the size of the heart increases. Since the output per beat is decreased, and the heart size is larger, the work per beat is no longer commensurate with the size of the heart; but with restoration of compensation the functional capacity is increased toward a normal level but on the average does not attain the level of which it was capable before the onset of failure. Although congestive failure alone may possibly explain up to one degree of fever, Kinsey and White[72] found that there was almost invariably some underlying complication to account in general for fever in cases of congestive heart failure, and in the order of frequency the four most common complications were pulmonary infarction, pulmonary infection (especially bronchopneumonia), active rheumatic fever, and acute coronary thrombosis. In the management of patients with heart failure Levine[73] stated that when the cardiac rhythm is regular the fact that the rate is rapid is no proof that the heart can stand more digitalis; in some cases whether more or less digitalis is needed can be ascertained only through trial and error, for the main point is whether the clinical condition improves with one type of regimen or another. Batterman et al[74] presented a method of obtaining rapid digitalization by the simultaneous administration of ouabain intravenously and digitalis leaf orally which has the following ad-

vantages: (1) the use of ouabain brings about rapid improvement; (2) the simultaneous administration of the more slowly absorbed digitalis leaf not only maintains the improvement, but also decreases or abolishes the gap between the beginning of digitalization and the establishment of a maintenance dose; (3) although more rapid than the usual method of digitalization, this method is a safe one, and is no more likely to produce toxicity; and (4) the method is applicable to patients with normal sinus rhythm as well as those with auricular fibrillation. Gold and Cattell[75] indicated that digitalis improves the function of the heart in cardiac failure by direct action on the heart muscle. Wood[76] stated that a fall in pulse rate is usually associated with improvement from digitalis therapy but is not essential. Meyer[77] suggested that it is not the change in the performance but rather in the condition of the heart under the influence of digitalis which is decisive for improvement. Provided it is given in proper dose and according to proper indications, Jucker[78] considers strophantus to be indicated in the treatment of acute insufficiency of the heart. Stroud and Twaddle[79] stated that coramine may have a beneficial action on the abnormal respirations associated with cardiac disease. Gross[80] suggested that the beneficial effects of diuresis in congestive heart failure may in part be due to reduction of excessive myocardial water content, thereby improving cardiac contractility. Volini and Levitt,[81] in their studies on mercurial diuresis, found that the fall in spinal fluid pressure which follows such diuresis is much greater, on the average, than that produced by spinal drainage, and is not accompanied by the possibility of danger. Horine[82] stated that the mercurial diuretics are of pronounced value in controlling dyspnea due to heart disease in the absence of manifest congestive heart failure, and even in the absence of moist rales at the lung bases. Brightman and Batterman[83] emphasized that, if the diuresis is not satisfactory after the rectal administration of a mercurial suppository, the intravenous or intramuscular route should be resorted to only after an appreciable time interval has elapsed to allow the body to care adequately for the previously absorbed mercury.

Angina Pectoris.—Scarlett[84] studied 100 cases of angina pectoris from which he pointed out that the care which the patient takes of his health after the condition becomes established is an important determining factor in the prognosis. In a review of 4,000 patient records Fitz-Hugh[85] noted an incidence of migraine in 22%; 27% of these migraine patients presented a syndrome of recurring precordial pain which seems to be a migraine equivalent; proper recognition of the syndrome of "precordial migraine" and its interpretation to the patient (as a sort of a harmless "headache around the heart") are useful steps in the management of these cases. Spillane and White[86] described cases of angina pectoris in which bouts of pain in one or both arms were, for varying periods of time, the only manifestations of ill health; such pains, constricting in character, appear suddenly on exertion, are felt usually at the wrists, forearms or elbows, and are relieved by rest or by nitroglycerine. Davis and Klainer[87] concluded that cardiac hypertrophy and increased cardiac work are factors other than coronary insufficiency, which are important in the production of angina pectoris in hypertensive heart disease. Among the patients studied by Hunt and co-workers[88] the emotional make-up appeared to be of little significance as a predisposing factor in the production of the anginal syndrome. Blackford[89] stated that of the various theories which have been advanced to explain angina pectoris in cases of mitral stenosis, that of the failing heart muscle is the simplest. Raab[90] theorized that attacks of stenocardiac pain on effort, emotion, cold, etc., are caused by anoxia of the heart muscle; that is, largely due to acute discharges of adrenalin from the suprarenal glands occurring physiologically under the conditions mentioned, and adrenalin exerts a specific anoxiating effect upon the heart muscle which is under normal circumstances compensated by simultaneous dilatation of the coronary arteries; and this compensatory mechanism must fail when the coronary arteries are unable to dilate adequately due to coronary sclerosis and thus an abnormally painful degree of myocardial asphyxia results.

Paroxysmal Tachycardia, etc.—Horine[91] used quinine dihydrochloride (grs. X in a 20 cc. solution) intravenously in 9 cases, paroxysmal in form, of auricular tachycardia, flutter or fibrillation, and immediate restoration of normal sinus rhythm resulted in 8 instances. Strong and Munroe[92] reported the case of a 41 year old male with an attack of paroxysmal ventricular

tachycardia that lasted 23 days without intermission; many therapeutic agents were tried, but the only one of value was quinidine, which was effective only when given intravenously in the large amount of 40 grains, Veran and associates[93] reported the case of a 43 year old male, in whom the shock of bad news suddenly induced an attack of tachycardia and who rapidly grew worse; various therapeutic measures, including intravenous injections of quinidine, failed, and finally procaine hydrochloride (10 cc. in a 1:200 concentration) was injected into the left stellate ganglion 32 days after the onset, and within 23 hours cardiac action became normal and all symptoms of cardiac failure gradually disappeared. Berry[94] cited the case of a 16 month infant who recovered from an attack of paroxysmal tachycardia with a rate of 336-340 a minute. Fine and Miller[95] reported a bizarre case in a 16 year old girl in whom paroxysmal auricular tachycardia invariably occurred in the sitting or standing positions, unless held in abeyance by digitalis or quindine therapy.

Auricular Fibrillation.—Weinstein and associates[96] found that digitalis, when used in therapeutic doses, lessened the ventricular acceleration which occurs following a standardized exercise test in ambulatory patients with auricular fibrillation, and decreased the pulse deficit at the same time, but it was not effective in patients who already had a slow ventricular rate. The Bishops[97] reported a case of auricular fibrillation observed for 25 years; this woman, first seen in 1914 at the age of 55, complained of palpitation and dyspnea on exertion; her pulse was 130, blood pressure 130/105, and a polygram showed auricular fibrillation; in 1931 mild congestive failure appeared, became moderate in 1932, and in 1934 became marked, and she died at the age of 80; autopsy revealed chronic rheumatic heart disease with mitral stenosis, calcification of the left auricular wall, left coronary artery stenosis due to atherosclerosis, concentric hypertrophy of the heart, and evidence of congestion and effusions of fluid. Evans[98] determined the relative value of certain digitalis preparations in heart failure with auricular fibrillation and of nine different substances he always induced effective digitalization and maintained it by powedered digitalis leaf, digifoline, digoxin, and Tr. digitalis, mentioned in the order of their therapeutic activity in customary doses and from a practical standpoint.

Heart-Block.—Van Der Kloot[99] described a case of heterogenous congenital bundle branch block, associated with what is probably an interventricular septal defect, in a 26 year old woman; at the present time this defect causes no symptoms, and is compatible with an active, useful existence. The prenatal diagnosis of complete congenital heart block is reported by Geiger and Hines;[100] a sudden slowing of the fetal heart rate which occurred between 17 and 19 hours before birth pointed to the onset of the abnormal mechanism at a specific time, and the sudden onset demanded a differential diagnosis between heart-block and intra-uterine asphyxia; the child is alive and healthy at five months of age, with the heart block still present.

3507 Lawrence Avenue.

BIBLIOGRAPHY

1. Illinois M. J., **68**: 165, 1935.
2. Ibid, **69**: 266, 1936.
3. Ibid, **71**: 509, 1937.
4. Ibid, **73**: 504, 1938.
5. Ibid, **76**: 182, 1939.
6. Ibid, **78**: 253, 1940.
7. M. Clin. N. Am., **24**: 1295, 1940.
8. Am. J. M. Sc., **200**: 289, 1940.
9. Am. Heart J., **20**: 592, 1940.
10. J. Lab. & Clin. Med., **25**: 796, 1940.
11. Am. Heart J., **19**: 683, 1940.
12. Internat. Clin., **3**: 135, 1940.
13. Am. Heart J., **19**: 166, 1940.
14. J.A.M.A., **114**: 474, 1940.
15. Arch. Int. Med., **66**: 807, 1940.
16. Am. Heart J., **20**: 106, 1940.
17. Arch. Int. Med., **65**: 606, 1940.
18. Am. Heart J., **20**: 236, 1940.
19. Arch. Int. Med., **65**: 321, 1940.
20. J.A.M.A., **115**: 1061, 1940.
21. New England J.M., **223**: 242, 1940.
22. J.A.M.A., **115**: 345, 1940.
23. Am. Heart J., **20**: 454, 1940.
24. Public Health Reports, **55**: 1599 and 1647, 1940.
25. Am. J.M.Sc., **199**: 759, 1940.
26. J.A.M.A., **114**: 2373, 1940.
27. New York State J.M., **40**: 525, 1940.
28. J.A.M.A., **115**: 1357, 1940.
29. New England J.M., **222**: 1067, 1940.
30. J.A.M.A., **115**: 1712, 1940.
31. Ann. Int. Med., **13**: 2154, 1940.
32. J.A.M.A., **115**: 1713, 1940.
33. Illinois M.J., **77**: 244, 1940.
34. Arch. Int. Med., **65**: 957, 1940.
35. Rhode Island M.J., **23**: 47, 1940.
36. Arch. Int. Med., **66**: 441, 1940.
37. Am. J. Syph., Gonorr., & Ven. Dis., **24**: 537, 1940.
38. Deleted by author.
39. Western J. Surg., Obst., & Gyne., **48**: 469, 1940.
40. Arch. Int. Med., **65**: 595, 1940.

41. Am. Heart J., 19: 185, 1940.
42. Ibid, 19: 193, 1940.
43. Ann. Int. Med., 13: 1799, 1940.
44. Am. J. M. Sc., 200: 577, 1940.
45. Am. Heart J., 19: 1, 1940.
46. Illinois M.J., 77: 240, 1940.
47. Am. Heart J., 19: 655, 1940.
48. Ann. Int. Med., 14: 65, 1940.
49. Am. Heart J., 20: 141, 1940.
50. Ann. Int. Med., 14: 495, 1940.
51. Am. J. M. Sc., 199: 628, 1940.
52. J. A. M. A., 114: 1512, 1940.
53. Am. J. M. Sc., 200: 474, 1940.
54. J. A. M. A., 115: 828, 1940.
55. Arch. Int. Med., 66: 800, 1940.
56. Am. J. Ob. & Gyn., 39: 24, 1940.
57. Am. Heart J., 19: 385, 1940.
58. Am. J. Ob. & Gyn., 39: 443, 1940.
59. Ibid, 39: 814, 1940.
60. Ann. Int. Med., 14: 653, 1940.
61. Ibid, 13: 2253, 1940.
62. Am. Heart J., 19: 106, 1940.
63. M. Clin. N. Am., 24: 1365, 1940.
64. Ann. Int. Med., 13: 2091, 1940.
65. Arch. Int. Med., 65: 279, 1940.
66. British Heart J., 2: 165, 1940.
67. J. Missouri M.A., 37: 7, 1940.
68. Southern Surg., 9: 459, 1940.
69. Am. Heart J., 20: 223, 1940.
70. Am. J. M. Sc., 200: 192, 1940.
71. Ann. Int. Med., 13: 2323, 1940.
72. Arch. Int. Med., 65: 163, 1940.
73. J. A. M. A., 115: 1715, 1940.
74. Am. Heart J., 20: 443, 1940.
75. Arch. Int. Med., 65: 263, 1940.
76. British Heart J., 2: 132, 1940.
77. Klin. Wochen., 18: 174, 1940.
78. Minerva Med., 1: 545, 1940.
79. Ann. Int. Med., 14: 361, 1940.
80. J. Lab. & Clin. Med., 25: 899, 1940.
81. Am. Heart J., 19: 566, 1940.
82. Southern M. J., 33: 315, 1940.
83. J. Lab. & Clin. Med., 25: 1038, 1940.
84. Canadian M. Assoc. J., 42: 34, 1940.
85. Internat. Clin., 1: 141, 1940.
86. British Heart J., 2: 123, 1940.
87. Am. Heart J., 19: 198, 1940.
88. Internat. Clin., 3: 15, 1940.
89. Am. Heart J., 20: 492, 1940.
90. Ann. Int. Med., 14: 688, 1940.
91. Internat. Clin., 4: 185, 1940.
92. Am. Heart J., 19: 486, 1940.
93. Presse Medicale, 48: 533, 1940.
94. Lancet, 1: 29, 1940.
95. Am. Heart J., 20: 366, 1940.
96. Am. J. M. Sc., 199: 498, 1940.
97. J. A. M. A., 114: 955, 1940.
98. British Heart J., 2: 51, 1940.
99. Am. Heart J., 19: 623, 1940.
100. J. A. M. A., 115: 2272, 1940.

Only rarely does a member of the intimate family of a tuberculosis patient have a negative tuberculin test. J. B. Bohorfoush, M.D. and Pauline Michael, M.D., Amer. Rev. of Tuber., Oct., 1940.

Hospital life does not protect against illness, and in fact the occurrence of disease such as appendicitis, pneumonia or tuberculosis appears to be more frequent among internes and residents than among a population less intimately associated with disease. Reginald Fitz, M.D., Jour. Amer. Med. Assn., Sept. 27, 1941.

THE ETIOLOGY OF STAMMERING: — Fundamentally a Wrong Psychophysiologic Habit in the Control of the Vocal Cords for the Production of an Individual Speech Sound; A Beginning Presentation.

ELMER L. KENYON, M.D.
CHICAGO

I. THE NORMAL ACTIVITIES OF THE VOCAL CORDS

In order to appreciate the action of the so-called vocal cords in the production of elemental speech sounds, we must bear in mind the following facts about them:- First, acting in connection with the musculature of the chest wall, the vocal cords are primarily and normally concerned with the production of two basal involuntary and voluntary animal functions, namely abduction and adduction. Since the action of abduction opens the vocal cords, it constitutes their manner of activity for breathing; and, since the act of adduction of the vocal cords causes their complete closure, it constitutes the activity which prevents breathing. The voluntary animal uses of the acts of adduction and of abduction of the vocal cords are important to life, and will be discussed in more detail in a later essay. Suffice it for present purposes to say that the larynx, through vocal cord action, serves (especially through the act of coughing), to protect the breathing organs from danger from the presence of foreign bodies. In this life saving function the act of adduction, employed either involuntarily or voluntarily, plays a fundamental part. Both abduction and adduction of the vocal cords are employed either in coordination or independently, not only involuntarily for certain definite purposes, but also voluntarily.

But it is to be noted that the individual, especially in this connection the child, has no knowledge of the existence of the vocal cords.

---

*Fourth of a series of essays presenting a new conception of the etiology of stammering. The three preceding were: —

1. Peripheral Physical Inhibition of Speech; an Essential Phenomenon and an Important Causal Factor of Stammering. The Archives of Otolaryngology, December 1930, Volume 12, pp. 769-784.

2. A Critical Examination of the Foundations of the "Recoil of the Vowel" Theory of the Cause of the Impediment of the Speech in Stammering. The Journal of Speech Disorders, June 1940, Volume 5, No. 2,

3. The Etiology of Stammering; An Examination into Recent Studies; with a Glance into the Future. The Illinois Medical Journal, Volume 79, No. 4, April 1941, pp. 334-341. The above essay appears also in The Journal of Speech Disorders of March, 1941.

Nevertheless, these organs of course are employed to accomplish both vital animal functions and eventually voice production. This lack of a knowledge of the existence and activities of the vocal cords, which, by preventing subjective knowledge of the significance of vocal cord adduction, serves as we shall see, to encourage their abnormal action in stammering.

It is also to be noted, that, through their accomplishment primarily of vital animal functions, the child's employment of voluntary abduction, as well as of adduction, definitely precedes their use in voice production. Abduction and adduction, as indicated by their involuntary as well as voluntary neurological mechanisms of control, are true animal functions, while in voice production they are employed only voluntarily, and for the especial purpose of producing sound. In the production of voice the two primary functions of abduction and adduction are simultaneously and voluntarily set into controlled opposed action so that the two vocal cords shall be held stationery and near to each other, in order to permit of being vibrated by the pressure of the breathed air.

Speech is based, first, on the psychologic creation of thought in terms of elemental speech sounds; second, on the voluntary detailed cerebral direction of the breathing function for the production of each elemental speech sound, and, third, on the repetitive order of production of the individual speech sounds, for the building of words and their combination into sentences. Excepting for the various oral articulative placements required, each vocal act, or each combination of such acts, which have for their purpose the production of a speech sound, consist (perhaps more or less modified) of some factor or factors concerned with the production of the breathing function. Speech is voluntary breathing adapted to the successive production of the individual sounds of speech by the breathing mechanism.

Thus by a series of cooperating acts the entire vocal (or breathing) mechanism is concerned at one time with the production of a single elemental speech sound. The first and primary act of each of such series of acts (on which the production of each elemental speech sound depends) concerns, first, the placement of the vocal cords for production of the sound in mind, and, second, their vibration by air pressure chiefly from, but also to, the lungs, created by the action of the chest musculature in producing the impact of the breathed air against and between the vocal cords already approximated for the production of a speech sound. Thus the vibratory foundation of each elemental speech sound is produced. These basal laryngeal vibrations are modified by secondary, associated and related articulative and palatal acts.

The sounds of the environmental speech are constantly in the mind of the child, encouraging him to attempt their production, through setting into balanced opposed action the two primary animal functions of the vocal cords, abduction and adduction. As he gradually develops the capability of controlling the entire vocal machine for the production of each elemental speech sound, a psychophysiologic habit for the creation of each sound is gradually developed. This habit also comes to involve frequently employed conbinations of sounds, and also words.

II. BUILDING THE PSYCHOPHYSIOLOGIC HABIT OF STAMMERING

Each animal function of the vocal cords, abduction and adduction, is voluntarily controllable. Whether (1) abduction alone, or (2) adduction alone, or (3) both together, for voice production, shall occur, depends on the voluntary visualization of a mental purpose. If (1) the mental imagery of breathing is voluntarily developed, abduction of the vocal cords occurs, resulting in an open laryngeal passage for air, if (2) the mental imagery of the complete arrest of the passage of air is conceived, the result is vocal cord adduction with complete closure of the vocal cords, and the consequent prevention of breathing and of voice production; (3) if the mental imagery of the production of a speech sound is voluntarily visualized a definite approximation of the vocal cords for that sound, due to simultaneous control over abduction and adduction, results.

Insofar as the child's mind is definitely focused on the production of a speech sound danger of mistaken effort at voice production has no existence, and a more or less correct speech sound must result. But as the development of speech

continues a danger may arise, due to the possibility of the accidental visualization by the child of the mental imagery that leads to the arrest of breathing, by which adduction of the vocal cords is produced and the production of breathing and of sound prevented. That this adduction of the vocal cords, the vocal mechanism being in action, constitutes the actual act of stammering is clearly demonstrable by intelligent observation of a large percentage of stammerers.

Indeed the key to an understanding of the act of stammering lies in the well known phenomenon of "blocking". In this typical, basal act of stammering, the musculature of the speech machine being in action in all of its parts, movement of each division of the mechanism of voice production, as well as the passage of breath, cease, while sound production is, therefore, necessarily absent. I shall be able in another essay to prove unequivocally that this phenomenon is possible only when the vocal cords are held by muscular action in a position of complete adduction.

In the development of the act of stammering, instead of focusing the mind on voice production the child becomes confused and accidentally employs not the mental imagery of voice production, but employs that for prevention of breathing, in other words, vocal cord adduction (closure). The child's mind may either quietly and unexcitedly, or excitedly and confusedly, slip into this natural psychophysiologic animal "trap". It requires a voluntary act, with which the child is more or less familiar. Even when the purpose of speech is not in the child's mind, he can accidently, or experimentally, slip voluntarily into the production of vocal cord adduction. Once he has accidently experienced the sensations of vocal cord adduction, instead of those of voice production, his childish interest may become aroused, causing him to deliberately repeat the act. On the other hand emotional excitement may serve as the basis for the disordered visualization that leads to vocal cord adduction. I remember a three year old white girl, who was set into violent emotional excitement by being frightened by a quite innocent act of a colored man. Excitement, weeping, screaming, and stammering began at once and the speech disorder continued into adult years. Such is one typical manner of inciting complete vocal cord closure during speech.

The onset of this interpolation of a misplaced psychophysiologic animal activity for that of voice production, which constitutes a single act of stammering, occurs almost entirely in childhood, when the normal production of voice for each speech sound is still more or less lacking as to fixity of habit action; the less the firmness of the establishment of habit for the normal laryngeal production of speech sounds, as in the earliest childhood years of speech, the greater is the tendency for stammering to take root. Until the normal habit of speech sound production has become completely established the child must direct the mind, at any rate to some degree, on the production of certain sounds or their combinations. This requirement affords the opportunity for the creation of mental confusion that may lead to the visualization of vocal cord adduction instead of that of voice production. Also circumstances of social speech situations, by creating emotion, or only mental confusion, may have the same effect.

More or less continuity, by repetition, is necessary to the development of the habit of approaching speech in this disastrous manner, if stammering is to result. For a child to start on this wrong activity but after a time to voluntarily relinquish it, is not very uncommon.

The complexities of the psychophysiologic activities of the chest-laryngeal muscular mechanism, including the subjective absence of knowledge of the vocal cords and their action, serve to create this unavoidable danger to the child in acquiring the capability of producing voice. "The trap of stammering" is created by these psychophysiologic complexities in acquiring voice, and must for all time serve to create a certain degree of danger to the child of becoming a stammerer.

III. TWO HABITS OF VOCAL CORD ACTION

This psychophysiologic abnormality of action of the chest-laryngeal muscular mechanism of voice production, which, after it is entered on, we call stammering, or stuttering, once well started shows exactly the same tendency to habit formation as that for normally produced speech sounds. In the stammering child, then, we

POSITION OF THE VOCAL CORDS

I.
Vocal cords abducted for breathing.

II.
Vocal cords in a balanced abducted - adducted position for production of the whispered voice.

III.
Vocal cords in a balanced abducted - adducted position for production of the loud type of voice.

IV.
Vocal cords in a state of complete adduction for prevention of breathing, — their position in the act of "blocking."

Passage from position I to position IV constitutes the act of adduction.

Passage from Position IV to position I constitutes the act of abduction.

eventually find two psychophysiologic habits developing simultaneously, each concerned with the movement of the vocal cords in relation to the intended voluntary production of a single speech sound; one of these developing habits is normal and competent for the production of that sound, while the other directs the organ of voice production — the vocal cords — not for the production of sound, but for the prevention of breathing and consequently also the prevention of voice production. Thus the developing child who stammers is handicapped by his growing tendency to employ the wrong chest-laryngeal habit, rather than the correct one, which, instead of producing voice, prevents its production, and so creates at the time of stammering the impossibility of continuity of speech.

IV. THE EVOLUTION OF STAMMERING

This unfortunate development of two habit actions concerned with the intended production of each elemental speech sound, one normal, and the other serving abnormally to prevent voice production, is subjectively not of very great importance to the stammering child, until developing intelligence serves to point out how serious his disordered speech is conceived by the people, young and old, in his environment. The sensitiveness of the mentally developing young stammerer to the smiles of people in his environment, to their mockings, and to other manners of more subtle criticism of his disturbed speech, leads directly to self-consciousness in talking. The young stammerer's sensitive self-consciousness with respect to his strangely disordered speech, very gradually becomes more pronounced, until at about ages fourteen and fifteen, when he comes to realize the seriousness of his social situation. Then the disorder begins to play havoc with the stammerer's social life, for psychologic complications necessarily are developed.

Emotion, timidity, self-consciousness, inferiority feelings and dread of attempting speech, are natural developments of his self-realization of the seriousness of his speech disorder. During speech he finds it, under such circumstances, well nigh impossible not to focus his mind on the act of stammering, instead of on that of normal voice production, which is theoretically possible. Here, again, the absence of a knowledge of the existence and activities of the vocal cords serves to prevent the stammerer from knowing what he does when he stammers and so to conceive

of protecting himself from its occurrence. Embarrassment is often constant. He knows not why he stammers or whether at any particular moment his speech will be normal or abnormal.

V. PSYCHOPHYSIOLOGIC CONFLICT

All this psychologic social disturbance and confusion eventually leads to another definite step in the evolutionary development of stammering. A definite, but subjectively confused, psychophysiologic conflict arises, and continues so long as stammering exists. All stammerers are able at times to talk normally, and at all times it is his constant aim so to talk; but his disturbed state of mind, meaning his emotion, his impaired self-confidence, and especially his ever present fear of impaired speech, directs his mind to visualize the production of the act of stammering, and then stammer he must. The psychophysiologic conflict, then, concerns on the one hand the attempt to hold the mind to normal speech production, and, on the other, the undesired slipping of the mind into the visualization of the mental imagery of stammering. The typical stammering of the mature stammerer results from this psychophysiologic conflict. He starts to stammer, but resists by his determination to talk normally if he can, thus a seesaw psychophysiologic struggle between an attempted normal act of speech, and stammering results. Various typical behavioristic attitudes of the stammerer may also be traced to this conflict.

Largely due to the critical attitude of the public toward him the stammerer learns to appreciate himself as a socially marked and discredited individual. He constantly faces one of the most distressing situations of any human being.

The primary explanation of stammering consists, then, not, as has been recently conceived by psychologists and psychiatrists, as some manner of general psychologic disturbance, of the individual child, but in a lurking, hidden, psychophysiologic danger involved in acquiring the control of the vocal mechanism for the production of speech sounds. It is like the loose board in the sidewalk, by which the leg may be broken.

The habit of stammering becomes deeper fixed, and usually more and more complicated, by emotion, lack of self-confidence, and fear of stammering; yet, as maturity of years and of experience produce the inevitable quieting influence on the emotions, the last years of the stammerer's life are apt to be attended with more and more success in gaining self control, and in adhering to normal speech.

VI. PROOF BY TREATMENT

With the most intelligent effort of which I am capable, I have spent many months in devising a new method of treatment, based on the conception that each act of stammering, as herein stated, represents a wrongly placed psychophysiologic habit action, which prevents the production of voice. For more than seven years I have treated stammering by this new method. The results confirm in a remarkable way the truth of the new conception of etiology.

During the ages from eight to twelve years inclusive, complete and permanent recovery has been attained in all cases so far treated. Ages eight to twelve years represent a period in the stammerer's life when, (1) sufficient intelligence on the part of the young stammerer has been attained for the employment of the required treatment, and (2) the psychophysiologic complication of emotional self-consciousness as to speech and of dread of talking, has not as yet become too seriously developed. At these early ages one is able to help the stammerer effectually to hold his mind on controlled normal talking, until the abnormal habit act of stammering has apparently actually been forgotten, or, at any rate, until normal speech has become completely dominant.

Moreover, after ages thirteen, or fourteen, the conditions and results of treatment by the new method have entirely changed. The stammerer is now mature enough to perceive that his stammering incites ridicule and criticism on the part of others. Consequently he develops serious self-consciousness as to his own talking. He is now unable to keep his mind for long away from the visualization of his habit of stammering. Therefore, one cannot teach him to talk invariably with his mind on normal, controlled speech, as can be done at ages from eight to twelve. There-

fore the acts of stammering continue with more, or less, frequency, and the habit of stammering continues. Nevertheless, I do not wish to imply the impossibility of recovery during these later years, but admit only its great difficulty at the present stage of our understanding. Employing more complicated conceptions of treatment than those employed at ages eight to twelve years, and with great persistence, especially at ages beyond but near to fourteen years, complete recovery has occasionally been secured.

The attainment of marked reduction in the frequency and severity of stammering, as well as marked improvement in self confidence is almost always possible. Very much of course depends on the intelligence and cooperative persistence of the stammerer.

Considering the manner of treatment employed and the regularity with which complete recovery occurs at ages eight to twelve years, the reaction of the young stammerer to this form of treatment seems to me to already serve almost as final proof of the correctness of the conception of etiology herein presented.

It is also to be noted, first, that the presentation of new conceptions as to etiology of stammering have been attended in the past only with failures as to success of treatment under their guidance; and, second, that the attainment of regularity of complete recovery in the treatment of stammering has never heretofore been even distantly approached at any age. And it is also to be noted that if complete recovery from stammering on a large scale can be secured during "the favorable age treatment period" — ages eight to twelve years — as now seems practically certain, a very large percentage, if not all, of stammering, may be caused to disappear after age thirteen and, fortunately, before the stammerer has suffered serious psychologic harm.

VII. Summary and Conclusions

I. The employment by the child of the chest-laryngeal mechanism of vocal cord action for purposes of speech sound production is involved in the fundamental activities of the same mechanism for animal purposes. Abduction and adduction of the vocal cords, which constitute their primary activities for animal purposes, are secondarily employed by the child for sound production. During the process of acquiring the ability to control the normal placement of the vocal cords for the production of speech sounds, certain children in attempting their production, either through sheer accident, or through emotional excitement, mistakenly visualize the mental imagery of vocal cord adduction instead of that voice production, thus producing complete vocal cord closure and preventing, instead of producing voice. If this mistaken act is repeated sufficiently a habit of substituting the adduction of the vocal cords for that of the production of speech sounds results.

II. Thus, the stammering child develops two habits of action of the vocal cords, when it is intended to produce a speech sound, one normal for voice production, and the other that of vocal cord adduction, which prevents the production of voice. The latter constitutes the foundation of all acts of stammering.

III. As the stammering child develops sufficient intelligence to observe and interpret the critical attitude of his fellows, young and old, towards his disordered speech, he begins, at about thirteen or fourteen years of age, to appreciate its seriousness. He then comes to be much disturbed about his stammering, and develops psychologic complications: — sensitiveness and self-consciousness as to his stammering, emotion, impaired social self-confidence, and dread and fear of talking.

IV. This speech situation, causing the stammerer to be seriously disturbed in social contacts, leads inevitably to a psychophysiologic conflict during speech. The stammerer desires and aims at normal speech, but his disturbed state of mind, especially emotion and fear of stammering, superinduces the visualization of the mental imagery on which vocal cord adduction depends, and he is compelled to stammer. The effort to talk normally thus is more or less constantly offset by the insistence of the habit of stammering, thus compelling disordered speech.

V. This psychophysiologic conflict, coupled with the disturbed state of mind of the stammerer, serves to explain the struggle character of the stammerer's speech, as well as its various other abnormalities, and also his typical behavioristic peculiarities.

VI. By a new method of treatment aimed to enable the stammerer to hold his mind on controlled normal production of speech, stammering, at ages eight to twelve years, can now be regularly and permanently overcome. This constitutes important evidence as to the correctness of the above conception of etiology.

185 N. Wabash Avenue

DOCTOR'S LADIES — MEDICINE'S CLOSEST ALLY

FRANK P. HAMMOND, M.D.
CHICAGO

It has become commonplace to point out that this is a critical period for the medical profession. Not only are physicians subject to all the pressures and upsets necessarily characteristic of the entire economic life of a nation at war; they remain the target of criticism of numerous groups outside the profession which have sought for years to establish as fact the fable that medicine has failed adequately to distribute the benefits of its scientific achievements, and which have sought to impose on the profession from without some measure of influence or control which would inevitably take from the physician the privilege of determining for whom and under what conditions and with what return he can practice his art.

In these circumstances, it would seem to be unbelievable that any group of physicians should have failed to encourage and support the efforts of a powerful group, sympathetic in its understanding of the practice of medicine as we have known it for the past generation, sincere in its interest in preserving the *status quo*, and remarkably well situated and equipped to publicize the methods and aims of the profession to the public through the normal, established channels of community life throughout the country. Yet, such failures are a matter of record in our own State. Worse still, it is recorded that in a few instances, county medical societies have not only failed to encourage the efforts of their woman's auxiliaries — for these are the powerful, sympathetic groups referred to — but have actually opposed or obstructed the very formation of auxiliaries which seek to advance medical interests. It is a sad fact that not many years ago the president of the Illinois State Medical Society was compelled to report that an effort to organize woman's auxiliaries to the county societies was turned down when presented to several of the county societies, and that "little interest in the organization was displayed."

Specific evidence of the same lack of interest is present in abundance, even after woman's auxiliaries all over the State were operating actively and enthusiastically and with splendid records of worthwhile achievement! A letter dated in December 1941 from the secretary of a county society in response to an appeal for assistance from the State Auxiliary Organization Chairman includes the following statements: "There is not a strong desire on the part of our members to establish such an auxiliary in —— County. The members of the society do not feel that they wish to approve the organization of an auxiliary in ———— County at this time." A State Auxiliary official seeking approval of the formation of an auxiliary in another locality writes: "We have been baffled by the attitude of the medical society in ———— County. The cause of this indifference or even hostility, is difficult to understand." Still another medical county society officer stated recently that he had presented the auxiliary question before the membership of his group and it was "turned down flat." In explanation, he volunteered that there were a few in the society who "had an aversion to all organizations which have a woman's auxiliary and the medical society was no exception to the rule." "Not interested," "unfavorable," "no advantage," "indifferent," "Opposed," — these are the phrases which occur time after time in the correspondence and conversations of those who have been making an effort to extend to every county society an opportunity to participate in and enjoy the benefits of the constructive programs now in operation in so many counties.

Why?

On analysis, the indifference or opposition to the formation of women's groups may be reduced to three essential factors; each of these is understandable, and, fortunately, each is subject to elimination or correction by appropriate presentation of the facts — except perhaps in extreme cases where a prejudice has developed which may not be overcome by the most eloquent

persuasion or the most unassailable logic. These three factors may be classified as (1) the inertia which is permitted by a failure to recognize the importance to medicine of any program of public or lay education, (2) the fear that a woman's organization, instead of becoming an agency of constructive lay education, might become merely a "gossip club" and actually encourage the exchange or spread of harmful information, and (3) the identity of women's auxiliaries among the many lay groups which are "meddling" with the practice of medicine — the very groups whose influence the medical auxiliaries are helping to overcome and destroy!

Perhaps, after all, there is little hope of awakening those few who at this late date remain unconvinced of the necessity for any program of lay education. Any physician who can doubt for a moment the desirability of widely disseminating accurate and soundly prepared information on, say, popular medical fallacies, or the necessity for periodic medical examinations, or the dangers inherent in the socialization of medicine, or maternal and infant welfare, venereal diseases, heart diseases or tuberculosis must indeed have forgotten the first dictum of the principles of medical ethics which he learned in the classroom: that a profession has for its prime object the service it can render to humanity!

Actually, of course, the physician doesn't exist today who objects to the wholesome public exposition of medical information, and this not alone for his interest in humanity but for his interest in his profession and himself as well — since a public not instructed to recognize and respect disease could rot and die in ignorance without seeking the physician's services. Those who are unresponsive today to the need for public education have for the most part become confused by the emphasis in recent years on the economic problems of the profession and as a result think immediately in terms of attack and defense, of controversy, when the idea of public education or public relations is introduced in connection with medicine. An individual physician or a local society may or may not feel that some discussion of the economic problem is appropriately a part of any program of lay education; the feeling about this one subject should hardly be permitted to prejudice the benefits to the community and the profession which may be expected through programs arranged by woman's auxiliaries consisting of lectures and radio talks by medical men and informal presentations of medical subjects about which no controversy whatsoever has existed for scores of years.

The fear that a woman's auxiliary may become an agency for the encouragement of harmful gossip — and this has been the stated objection to the formation of a woman's group in at least one instance — disposes of itself on a moment's examination. There are, unquestionably a few doctors who are afflicted with irresponsible wives. That the unfortunate results of the predilection for gossip of a few women could be eliminated or even appreciably diminished by the discouragement of organized activity for the medical wives of an entire community seems absurd in the extreme! As a matter of fact, the opportunity provided in a woman's auxiliary for contact with the thoughtful, intelligent women who are invariably its leaders may be expected to accomplish more to reform the erring member than all the lectures and rebukes administered by an irate or embarrassed husband!

The activity in recent years of medical plans, schemes and promotions has been widespread and so feverish that it is not hard to sympathize with the medical man who reacts unfavorably at once to the formation of another lay group on the periphery of his scientific sphere of activity. "Leave medicine to the physician!" is his cry, and the physician is impossible to find who will fail to answer with a heartfelt "Amen!" Less understandable, however, is the reasoning through which physicians' wives are identified with these meddlesome outsiders. That the woman's auxiliary of the medical society must rank first among all community organizations in the friendliness of its interest is obvious. That it will look to the medical society itself for guidance in the arrangement of its programs and the inclusion of only those features which the local society's advisory committee approves is as sure as that the constituents of the one group will continue to look to the other's for their individual support, welfare and happiness! Their interests are coincidental; it is inconceivable that the conflict which may be imagined as possible of occurrence between the medical society and any other group in the community could in fact occur in the case of the woman's auxiliary. Ac-

tually, of course, we as physicians respond warmly to effort on the part of any lay organization to comment favorably or reflect credit on our professional activity. Let the Rotary, Kiwanis, Chamber of Commerce, Woman's Club or Church Society of our community include in its program a discussion featuring useful medical information or otherwise related creditably to our profession and our own meeting next following is sure to produce a spontaneous resolution of gratification, warm and genuine in its recognition of a friendly gesture on the part of the sponsor. That we should be less enthusiastic in our response to the efforts of our own *best friends,* our wives, to create and support an organization whose sole objective is to extend our usefulness seems unthinkable!

The pattern of constructive work for woman's auxiliaries is well established in our State today, and in every other state in the union; officers and committee of the State Auxiliary are eager to extend a helping hand in promoting and organizing auxiliaries to every county medical society in the State to the end that the composite statewide effort shall rebound to the benefit of organized medicine. It would be impossible today for the interest of a newly formed auxiliary to wane through lack of proper purpose or well planned effort to achieve that goal. A partial list of the active committees of a typical auxiliary should suffice to illustrate the point. The Hygeia Committee functions to increase the circulation of the non-profit, informative monthly magazine edited by physicians of our own national organization to improve the public understanding of medical subjects; the Legislative Committee — working under the guidance of the parallel committee of the county medical society — seeks to organize the women voters of the community and focus the influence of women on public officials in municipal, county, state and federal office to the end that legislation favorable to medicine shall have proper consideration and subversive or harmful legislation shall be opposed; the Philanthropic Committee gains support for the established benevolent fund aiding infirm and indigent physicians and their families and thus relieving the community of the burden of their care; the Public Relations Committee arranges for health talks and medical programs at school, church, social and civic meetings; the Program Committee is responsible for the selection of subjects and speakers for the monthly meetings of the auxiliary members themselves and their guests who are representative of the entire community. A few of the program arranged for one particular auxiliary are characteristic of the thought-provoking subjects which are being presented — by physicians — to the organized auxiliary women of Illinois through the earnest efforts of their leaders: "Medical Aspects of Selective Service," "New Developments in the Field of Nutrition," "Tuberculosis in Children," "Hand to Mouth" (a sound motion picture on infectious diseases prepared under medical supervision), "Current Events in Medicine," "An Evaluation of Recent Popular Books on Medical Subjects," "Control of Cancer," and "Recognition and Exposure of Quackery."

The value of women's organizations to the public relations program of many established groups is widely known — witness the active auxiliaries of such organizations as the National Association of Manufacturers, the American Legion, the American Federation of Labor and thousands of hospitals, churches, lodges and service clubs which have found that a militant woman's group serves to extend their usefulness and help to interpret the activity of their respective organizations to the public. That organized medicine accepts the pattern established by no group outside the profession is too obvious to need repetition here; but medicine cannot afford to rest complacently on its scientific laurels at this critical time and refuse to accept any ethical and demonstrably effective means at its disposal to extend public understanding of health and medical subjects and public recognition of the values inherent in the practice of medicine the American way.

It is natural that the doctors' wives who have been devoted to and active in auxiliary work during the past decade should have become exceedingly conscious of their duty and loyalty to the medical profession: they themselves first became better acquainted with the part medicine plays in the affairs of men; their enthusiastic desire to spread this knowledge, under the supervision of the medical society's advisory committee, to their lay friends and associates is an inevitable consequence. The results of their past performance demonstrate that their work has been immeasurably valuable to the profession. A past president

of the National Woman's Auxiliary said recently: "The woman's medical auxiliary is becoming recognized as one of the most potent factors in disseminating wholesome medical education to the lay public." The principles of medical ethics (Chapter IV, Section 1) state: Physicians, as good citizens and because their professional training specially qualifies them to render this service, should give advice concerning the public health of the community. They should bear their full part in enforcing its laws and sustaining the institutions that advance the interests of humanity. They should be ready to counsel the public on subjects relating to sanitary police, public hygiene and legal medicine."

Is this solemn obligation discharged in full when any opportunity to counsel and advise the public is being overlooked? The doctors' ladies of Illinois have demonstrated that they are competent and eager to assist the profession in the education of the public.

Can we fail — in any particular — to implement their competence?

Advisory Committee to the Woman's Auxiliary of the Illinois State Medical Society
Harold M. Camp
Everett P. Coleman
Edwin S. Hamilton
Rollo K. Packard
Frank P. Hammond, Chairman

MILITARY MANPOWER IN THE UNITED STATES

The military manpower of the United States at the present time, according to statisticians of the Metropolitan Life Insurance Company, amounts to 28 million between the ages of 18 and 44 and this number is expected to increase to a high point of 30.3 million about the year 1955. Then it is expected to decrease so that by 1980 there will be 28.4 million men of military ages, or 18.5 per cent of the total population. The total population of all ages, however, will continue to increase until about 1980.

The number of men between the ages covered by the present Selective Service Act, that is, ages 21 to 35, increased from about 10 million in 1900 to almost 16.4 million in 1940.—*Illinois Dental Journal, July, 1941.*

SURGICAL EXPERIENCES — 1918

One case operated upon by me during the last war showed that occasionally severity of wounding is compatible with recovery despite unfavorable surgical environment, disordered transport, and the necessity of premature evacuation.

On the first day of the enemy attack an officer received a left-side abdominothoracic wound, which necessitated a transdiaphragmatic splenectomy, the closure of two large wounds in the stomach and the repair of the diaphragm, pleural "toilette" and the closure of the chest wound. He was evacuated on an open truck less than 24 hours after his operation. Despite difficulties of that period of turmoil, the officer was able to write subsequently from Ireland thanking me for the part which I had played in promoting his recovery, and expressing his eagerness and almost feverish anxiety to return to France and rejoin his South Irish Division.

In the summer of 1918, an Australian officer who had undergone a resection of damaged small intestine from high-explosive, and whose abdomen has been closed hurriedly by through-and-through sutures, was immersed in the sea as a result of the torpedoing of the hospital ship "Warilda." The man was dragged by a rope around his waist into a destroyer; he made a good recovery and appeared little worse for his adventure.

In this war the chances of recovery of an abdominal case from such an outrage have been prejudiced still further by the air-bombardment of wounded in the water, a practice which has been freely indulged in by the German, even upon his Italian allies, and few that had already been wounded in the belly could have survived. The dropping of incendiary bombs upon shipwrecked men struggling in oil covered water inflicts upon the wounded and unwounded a death so horrible that only perverted mentality could have conceived it.—*Rear-Admiral Gordon Gordon-Taylor, M.S., F.R.C.S., F.R.A.C.S., The Practitioner, July,* 147: 448-462, 1941.

The doctor had two children who were considered the prettiest little girls in the district.

While out walking one day, they passed two small boys: one lived in the village and the other was a visitor.

"I say," said the latter, "who are those little girls?"

"They're the doctor's children," replied the village boy. "He always keeps the best for himself."

Clinicopathologic Conferences

J. J. Moore, M.D., Department Editor.

PRESENTATION OF CASES BY

E. L. Benjamin, M.D.

Evanston Hospital Association

EVANSTON

CASE 1—CARCINOMA OF THE GALLBLADDER

William Gill: This 71 year old, widowed, white female was admitted October 6, 1941, complaining of generalized jaundice and pruritus, acholic stools, and weakness of a week's duration. She had lost 10 pounds in the past year. Physical examination was normal except for the generalized icterus. Her blood pressure was 185/110. Laboratory examination: Hemoglobin 14.5 grams (94 per cent); erythrocytes 4,960,000; leucocytes 9,400. Urinalysis was normal except for the presence of bile pigment. The blood cholesterol was 303 mg. and the icterus index was 41.0 units. Repeated stool examinations were positive for occult blood by the benzidine test. A roentgenogram failed to reveal gallstones. Electrocardiogram: "Left bundle branch block and gross myocardial damage." On October 10 the prothrombin time was 77 per cent of normal. Oral administration of vitamin K and bile salts was started and on October 13 and October 17 the prothrombin time was 80 per cent of normal.

On October 18 under ethylene and ether anesthesia a cholecystectomy was performed. Following resection of 3 cm. of the common duct, an end-to-end anastomosis was performed over a "T" tube. Sixteen hours after operation the patient presented all the symptoms of peripheral circulatory collapse which responded to general supportive measures. An electrocardiogram on October 20 revealed numerous ectopic beats and left bundle branch block. The icterus index rose to 76 and the nonprotein nitrogen to 120. Bile was in the urine. Ivy bleeding time was one minute; an immediate direct Van den Bergh reaction was present. Thereafter she ran a gradual downhill course and expired on October 24, the fifth postoperative day and about 18 days after the onset of her illness.

The preoperative diagnosis was chronic cholecystitis and cholecystolithiasis. The final diagnosis was coronary insufficiency and terminal pneumonia.

E. L. Benjamin: The rigid, contracted, pyramidal-shaped gallbladder removed at operation was 9.5 cm. long. Fifteen millimeters of the thickened cystic duct was attached. The serosal surface was roughened by fatty fibrous tags. The fibrous wall varied from 3 to 4 mm. in thickness. A small amount of pale bile and 60 pale gray, facetted stones, 7 to 8 mm. in diameter, were present. One stone was in the cystic duct. The fundic mucosa was finely granular and yellow. The mucosa of the cystic duct was pale yellow and velvety; the wall was indurated. A small piece of common duct was also received.

The microscopic picture was that of a malignant neoplasia of the mucosa forming slight villous projections of columnar epithelium and

Figure 1—Papillary carcinoma of the gallbladder showing the abrupt transition from normal to malignant mucosa and the subepithelial pervasion by malignant glands. X 200

also pervading the fibrous wall in the form of anaplastic cell nests (figure 1). The perineural lymphatics contained tumor cell emboli. The mucosa of the cystic and common ducts also contained isolated areas of malignancy suggesting a multicentric origin even though the walls of these structures were also pervaded and the lymphatic vessels and the perineural lymphatic channels contained tumor cell emboli. A heavy desmoplastic reaction was present.

Necropsy was performed one hour and forty minutes after death. The body was well proportioned and slightly obese; the entire skin was the color of saffron. The conjunctivas, lips, and buccal membranes were yellow. A recent, oblique, right rectus laparotomy wound, 22 cm. long, contained a rubber tube in its upper pole which was a continuation of the "T" tube over which the partially resected ductus choledochus had been sutured. Separation of the skin sutures exposed a gaping wound with edematous, bile-stained walls, focal necrosis of the subcutaneous fat tissue, and a bulging floor formed by inflamed, bile-stained, distended bowel and the omentum. The bed of the recently removed gallbladder, the hepatic flexure of the colon and adjacent structures were united by a delicate fibrinous exudate to form a cavity filled with turbid, yellow, fibrin-flecked fluid. The drainage tube was enclosed in a delicate yellow tract of granulation tissue. The lesser omental cavity, lower abdomen, and pelvis contained considerable clear, thin, yellow fluid. The retroperitoneal tissue in the abdominal gutters was edematous. The right dome of the diaphragm was elevated to the level of the fourth rib; the left dome was level with the fifth rib. The pericardial sac contained about 50 ml. of thin, clear, yellow fluid. Five hundred milliliters of a similiar fluid was present in each pleural cavity.

The small thyroid gland weighed 18 grams. Except for several small fetal adenomas it revealed no significant changes. The heart weighed 240 grams. The coronary arteries exhibited a high grade atherosclerosis with calcification and extreme narrowing of the anterior descending branch. The firm myocardium was yellow-brown; a contracted linear scar, 2 cm. long, was in the muscular septum. The margins of the mitral valves were thickened; the bases of the aortic cusps were calcified and the tricuspid valve was dilated. High grade atherosclerosis was seen in the aorta and its major branches. The trachea and bronchial tree were filled with mucopurulent material. The bases of both lower pulmonary lobes were atelectatic; the rest of the lung parenchyma was congested and edematous. Moderate emphysema was also present.

The liver weighed 1,600 grams. Except over the inferior surface and lower border of the ventral surface of the right lobe, the capsule was smooth and transparent. The abnormally firm, dark olive green parenchyma was composed of distinct lobules. The bile ducts were distended with pale yellow bile. The gallbladder and cystic duct were absent. The inferior surface of the right lobe was granular and dark red to yellow-gray. The silk sutures approximating the divided common duct had partly sloughed out to permit separation of the necrotic, severed ends of the ducts. The "T" tube was in posi-

tion. The hepatic, subpyloric, and peripancreatic lymph nodes were moderately enlarged, firm, and pale green-gray and on section revealed some firm, granular areas. The kidneys exhibited moderate senile atherosclerotic changes. There were several polyps in the lesser curvature of the stomach. The internal genitalia were atrophic.

The pertinent microscopic findings were as follows: An early obstructive biliary cirrhosis with moderate fatty change of the liver was characterized by numerous bile ducts surrounded by edematous connective tissue infiltrated with small round cells. These ducts as well as the canaliculae were filled with masses of inspissated bile. The cells of Kupfer were also heavily laden with bile pigment. Many of the hepatic cells at the periphery and central portions of the lobules were pigmented and undergoing degeneration. The hepatic, subpyloric, and peripancreatic lymph nodes were extensively involved by metastatic cancer. The latter assumed the form of irregular alveoli and ducts lined by columnar and cuboidal epithelium, exhibiting considerable hyperchromatism, numerous mitoses, and variation in size and shape. An acute inflammatory reaction was present in the capsule of the pancreas, the peripancreatic fat tissue, and first portion of the duodenum. There was an acute inflammatory reaction and engorgement of the spleen. The kidneys exhibited small triangular cortical areas of arteriosclerotic atrophy and beginning icteric nephrosis as characterized by enlarged, swollen, degenerated epithelial cells containing bile pigment. Some of the degenerated epithelium was desquamated.

The essential anatomic diagnosis was: Status post cholecystectomy; resection and anastomosis of the ductus choledochus with "T" tube drainage; metastatic carcinoma of the hepatic, subpyloric, peripancreatic, and peri-aortic lymph nodes; obstructive biliary cirrhosis; choleperitonitis (right upper quadrant); generalized senile atherosclerosis, grade IV; stenosis of the anterior descending branch of the left coronary artery; scar (healed infarct) of the interventricular muscular septum of the heart; brown atrophy of the myocardium; dilatation of the tricuspid valve (relative insufficiency); pulmonary emphysema; bilateral basal pulmonary atelectasis; bilateral hydrothorax, hydropericardium, and ascites; multiple polyps of the gastric mucosa; icterus gravis; infected, oblique, right rectus laparotomy wound.

CASE 2—CARCINOMA OF THE GALLBLADDER

William Gill: This 56 year old, married, white female was admitted September 24, 1941, complaining of generalized jaundice and pruritus of two weeks' duration. Intermittent epigastric distention had been present for a month. Physical examination revealed a marked generalized icterus. The liver edge was palpable 6 cm. below the right costal margin and a spherical mass, the gallbladder, could be felt about 4 cm. below the liver edge. The blood pressure was 140/85.

On September 24 a roentgenogram of the abdomen showed three large gallstones: two low in the abdomen and the other near the liver margin. On September 25 the hemoglobin was 14 grams (90 per cent); erythrocyte count was 4,660,000; and the leucocyte count was 7,500. Urinalysis was reported as normal. The icterus index was 66.6.

Cholecystitis, cholelithiasis, and obstruction of the common duct was diagnosed. On October 2, 1941, cholecystectomy and drainage of the common bile duct and right hepatic duct was performed under ethylene-oxygen and ether anesthesia. Bile began to drain freely on the first postoperative day. The patient's postoperative course was normal until the twenty-first day when she suddenly became dyspneic and a tachycardia developed. Supportive measures were unsuccessful and she expired six hours after the onset of this episode, 22 days after operation, and about three months after the first symptoms of her fatal illness.

E. L. Benjamin: The gallbladder removed at operation was 10 cm. long. The tough, rigid walls were 1 to 3 mm. thick. Three dark green, mottled yellow, facetted concretions, 18 to 25 mm. in diameter, and a small amount of clear mucoid fluid were present. The yellow mucosa was slightly granular. Fluid from the common duct was chemically negative for bile. Microscopic sections revealed a hyalinized collagenous connective tissue, little muscle, a few blood vessels, and a few isolated cell nests of moderately anaplastic columnar epithelium irregularly distributed in the wall and in the perineural lym-

phatics (figure 2). In many places the mucosa was absent but where present it was represented by a single layer of columnar cells some of which were malignant.

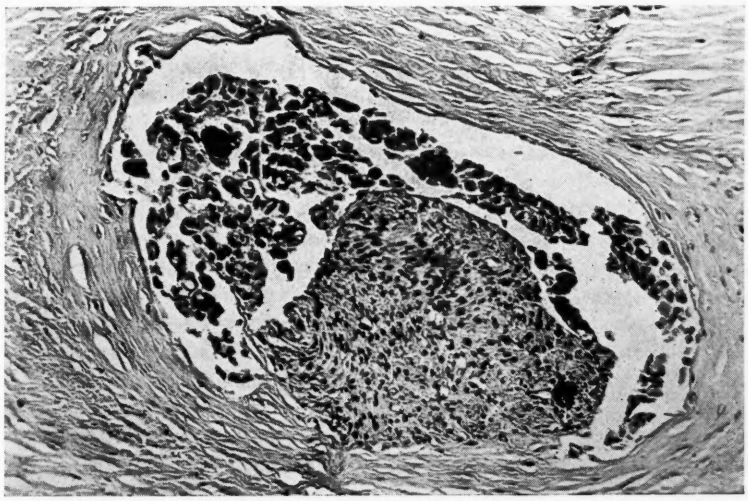


Figure 2—Perineural lymphatic metastasis in the wall of the gallbladder. X 200

The necropsy upon the body of this emaciated, jaundiced, 56 year old female was performed two hours after death. A few small subcutaneous ecchymoses were scattered over the lower extremities. Two rubber tubes emerged from the upper pole of a healing right pararectus laparotomy wound, 20 cm. long. One of the tubes, a catheter, entered the hepatic duct. A "T" tube passed into the common duct. The latter was indurated and stenosed distal to the "T" tube. The firm, dark olive green liver extended 3 cm. below the right costal margin. Bile peritonitis was present in the right upper quadrant and areas of chalky focal necrosis were seen in the fat tissue and about the head of the pancreas. The lungs were emphysematous; the basal portions were congested and edematous.

The pale brown heart weighed 255 grams. A few subepicardial petechiae were present. The aorta was only slightly atheromatous. The liver, pancreas, duodenum, stomach, and esophagus together weighed 1,960 grams. Multiple sectioned surfaces of the liver were firm, dark green, and distinctly lobulated. The distended bile ducts were filled with pale mucoid material. The hepatic ducts were somewhat enlarged, firm, dark gray-green, and contained a few small, firm, granular areas. The bed of the absent gallbladder was finely granular and pale yellow. The ductus choledochus was 65 mm. and the ductus hepaticus was 30 mm. long. The circumference of the former was 20 mm.; of the latter, 7 mm. The large bile duct just within the liver substance was 21 mm. in circumference. The mucosa of the ducts was pale yellow. Mucosal hemorrhages in the gastric mucosa were responsible for the presence of tarry, bloody material in the small bowel. The pancreas contained a few pinpoint-sized necrotic areas.

Both kidneys were light yellow-green and slightly swollen. The right weighed 123 grams and the left, 120 grams. The markings usually seen on the surfaces made by sectioning were obscured. The internal genitalia were atrophic. The corpus uteri contained several intramural and subserous leiomyomas. A benign polyp was in the cervix.

The essential microscopic findings in this case were similar to the previous one, i.e., metastatic carcinoma of the walls of the extrahepatic biliary ducts and hepatic lymph nodes. Obstructive biliary cirrhosis; focal necrosis of the pancreas; and icteric nephrosis.

The anatomic diagnosis was: Status post cholecystectomy; drainage of the left tributary of the hepatic duct and common duct; obstructive biliary cirrhosis; icteric nephrosis; focal necrosis of the pancreas (head); pulmonary emphysema; bilateral hypostatic pulmonary congestion and edema; leiomyomas of the uterus; polyps of the cervix; icterus gravis; subepicardial petechiae; hemorrhagic erosions of the gastric mucosa; melena; right pararectus laparotomy wound.

DISCUSSION

These two cases of cancer of the gallbladder, terminating so close together, are the sixth and seventh instances occurring in this hospital during the past five years; six were found during the last two and one-half years. The incidence is about comparable to that of the Memorial Hospital (1.22 per cent, Pack and LeFevre). Carcinoma of the gallbladder and gallstones are much more frequent in females. The average age for cancer of the gallbladder is 57 years. Both of our cases were females, both had chronic inflammation and concretions of the gallbladder and their ages were 71 and 56 years respectively. Metastatic deposits were only regional. Peritoneal extensions of the malignancy constricted the ducts (a stone obstructed one) and a common method of extension, i.e., perineural lymphatic metastases, was quite prominent. Obstructive and regurgitation jaundice caused an obstructive biliary cirrhosis associated with icterus (cholemia) and icteric nephrosis. Eighteen and ninety days were the respective durations of the clinical manifestations of the disease.

CASE 3—RECTICULUM CELL LYMPHOSARCOMA OF THE GASTROINTESTINAL TRACT

Walter S. Priest: I first saw this 67 year old man in March, 1941. In April, 1940, the diagnosis of Hodgkin's disease had been made from the x-ray findings of a large mass in the hilum of the right lung and a mass in the cardia of the stomach. The patient was given extensive x-ray treatment until the first of January, 1941. When I first saw this patient the peripheral lymph nodes were not palpable. His first complaint at this time was rectal pain, severe enough to confine him much of the time to his bed. A perirectal abscess and small hemorrhoidal tags were found on rectal examination. He was first admitted to the Evanston Hospital March 24, 1941. Doctor Nesselrod will tell you later of his proctoscopic findings. He remained in the hospital until April 17 during which period he received four blood transfusions for an aplastic type of anemia. When he left the hospital his red count was in the neighborhood of four million and his hemoglobin 75 per cent. By the sixth of May his hemoglobin had dropped to 66 per cent, his red count was 4,250,000, and the white count was 5,200. The differential count was essentially normal. By the second of June his hemoglobin had dropped to 52 per cent, his red cells to 3,780,000 but the white count had increased to 9,100. Triweekly injections of liver extract were given for several weeks. Following this the hemoglobin rose to 78 per cent and his red cell count went up to four million. On July 8 it was noted that his left tonsil had enlarged so that it practically filled the pharynx. This enlargement apparently had occurred over a period of three weeks. After consultation with Doctors Galloway and Soper, x-ray therapy was directed toward the enlarged tonsil. The enlarged tonsil promptly was reduced to normal size. On August 12, 1941, liver was again given for the falling blood count. At this time a small subcutaneous tumor in the left breast was removed. The microscopic diagnosis was reticulum cell lymphosarcoma. The progressive anemia failed to respond to therapy. By October 8 his hemoglobin had dropped to 44 per cent, his red cells to 3,300,000, and white cells to 6,000. There was 41 per cent polymorphonuclear leucocytes present.

From April until October the patient's subjective condition had improved. He felt stronger, was able to drive a car, and enjoyed life quite well. However, after October 10 he began to feel weaker and he looked anemic. His hemoglobin was 55 per cent. Six days after a blood transfusion his hemoglobin was 53 per cent, his red count was 3,540,000, and the white count was 4,000. The differential examination revealed one myelocyte, there was considerable anisocytosis, moderate poikilocytosis, and polychromatophilia. He then commenced to experience difficulty from watery diarrhea. Opium and bismuth subnitrate failed to control this difficulty.

At 11:30 a.m. on November 8 he developed a sudden pain in his abdomen which was not relieved by codeine, aspirin, or neumbutal. After the pain failed to subside I was called to see him

at 2 p.m. and made a diagnosis of acute surgical abdomen. The flanks were dull and tender. The distended abdomen was soft and definite rebound tenderness was not observed. His pulse was 102 and fair quality. He was immediately sent to the hospital. The causes of his acute abdominal condition were considered to be perforation of the bowel involved by the lymphosarcomatous process or frank hemorrhage into the peritoneal cavity from an erosion of the vessel by the tumor. Intestinal obstruction and acute appendicitis with rupture were also considered. Because of his poor general condition we wished to avoid surgery if possible. With the hope that the condition was an intestinal obstruction, a Wagensteen tube was inserted and he was observed for three hours. During this period the red blood count and hemoglobin did not fall and his pulse remained under 100 and of good quality. At no time did the leucocyte count go above 7,000. The abdomen did not become board like. After three hours of gastric decompression without affect on the abdominal distention, a laparotomy was performed by Doctor Hobart.

J. P. Nesselrod: On March 26, 1941, sacral anesthesia was established to facilitate both the proctoscopic examination and the surgical treatment of an anal fistula. The proctoscopic report is as follows: "There is a draining sinus on the right posterior 1 cm. from the anal margin. The primary opening of the fistulous tract lies immediately to the right of the posterior midline in the dentate margin. In addition there are several other deeply scarred anal pockets. The anal canal is contracted, grade III, due to the extensive development of scar tissue. Throughout the rectum I find numerous submucosal nodules from 2 mm. to 2 cm. in diameter which lend a coarse, pebbled appearance to the gut wall. The overlying mucous membrane is intact but easily traumatized. There is no evidence of rectal valves. The lumen of the rectum is narrowed one-half. Tissue was removed for microscopic study and still and moving pictures were made in color."

N. D. Smith (1933) found that lymphosarcoma of the rectum and sigmoid is rare. The final diagnosis depends on histopathologic study.

M. H. Hobart: I first saw this man with Doctor Priest for a small tumor of the left breast which was removed under local anesthesia. I saw him again about ten days ago for an acute condition within the abdomen. Although the abdomen was well distended and tender, board-like rigidity was absent. His white blood count was a little over 7,000. No relief followed Wagensteen decompression. An x-ray flat plate of the abdomen revealed no signs of obstruction. A large mass the size of a fist was felt above the navel. At laparotomy a large quantity of thin, cloudy fluid was found. The mass palpated on external examination was located in the mesentery of the small intestine. The spleen was about half the size of a man's head. A fecal discharge located in the right lower abdominal quadrant came from a perforation located in the tumorous wall of the intestine. This part of the intestine tore easily. As it was impossible to rsect the bowel the first stage of a Mikulicz's operation was performed. Thirty-six hours later the intestine was opened. After the operation he became progressively weaker. One or two bowel movements occurred. The Mikulicz's opening drained; his fever became higher, he lapsed into unconsciousness, and died on the sixth postoperative day.

E. R. Crowder: This patient was given a total of 12,800r from April, 1940, to August, 1941; of that amount, 11,200 was given elsewhere; 1,600 was given here. The first series of treatments which we did for this man was done because of an enlarged left tonsil which was interfering with his breathing and swallowing. He was given 1,100r (skin dose) to a small area over the cervical region. An excellent and prompt response to the treatment was obtained.

The second series of treatments was begun in an effort to combat the patient's anemia. Because of the fact that the patient had had rather large doses of x-ray treatments previously, it was not possible to determine whether the patient's anemia was due to a failure of function of the red blood forming organ due to hyperplasia of the reticulo-endothelial cells in the bone marrow, or due to a destruction of the red blood forming organ by x-ray treatment. We, therefore, gave two rather small doses of general body radiation and awaited results. No favorable results regarding the anemia were obtained. The treatment was, therefore, discontinued because we felt it was inadvisable to add further insult to the red blood forming organ, if the

anemia was due to x-ray damage. An anemia in this class of disease, which includes chronic leukemia, will frequently respond favorably to general body radiation. In this case we could not be sure of the cause of the anemia. The treatment was, therefore, not completed.

In the treatment of this disease with x-ray, two methods can be employed: (1). The treatment of the local lesions by relatively large doses of x-ray. (2). The treatment of large areas of the body or of the whole body with relatively small doses of x-ray. It has been found that when small doses are used on large areas of the body, it is posible to exclude the local lesions from any effect by direct radiation and still obtain a decrease in the size of these lesions and a satisfactory remission of the disease. The fact that a remission of this disease can be produced by x-ray treatment when the obvious site of disease is excluded from the field of treatment, raises many interesting points for speculation. The most obvious explanation for this observation is that in the treatment of the whole body with radiation, an intermediate product is produced which brings about a remission of the disease which has not been directly radiated.

Reticulum cell lymphosarcoma and Hodgkin's disease respond in the same manner to x-ray treatment. They each have a high degree of radio sensitivity; and they each exhibit the phenomena of response to whole body radiation. These two diseases are similar in many other ways. The greatest difference between these two diseases is in their morphologic characteristics. When morphologists encounter difficulty in differentiating between the two diseases from a microscopic preparation, they sometimes solve the problem by a compromise and call the disease Hodgkin's sarcoma. This compromise suggests that when differentiation on a morphologic basis is difficult, we may be dealing with a case which occupies a middle ground between the extremes of a single disease. There are, in short, several reasons for regarding reticulum cell lymphosarcoma and Hodgkin's disease as the same disease.

Because these tumors can be reduced in size by an intermediate product which is produced when x-ray is absorbed in normal tissue of the diseased individual, it seems advisable to reconsider the classification of the disease. It is possible that reticulum cell lymphosarcoma may be more closely allied to pernicious anemia than it is to neoplasm.

E. L. Benjamin: The body of this 66 year old white male was considerably emaciated and moderately jaundiced. Although the superficial lymph nodes were not palpable on external examination, dissection of the axillary tissue exposed a few small, gray-red lymph nodes about the size of a pea. A recent midline laparotomy wound, 18 cm. long, presented in its midportion a double-barrel ileostomy. The wound was closed by metal skin clips and three deep retention sutures. When opened the wound revealed necrotic walls extending down to the peritoneum, bathed in considerable purulent material. Clos. welchii and Esch. coli were cultured from the pus. Approximately 300 ml. of yellow, milky fluid was in the abdominal cavity. The mass previously described was the size of a fist and occupied the mesentery, over which passed the duodenum and jejunum. Considerable fatty tissue was deposited in the mesentery, omentum, and anterior abdominal wall. Many of the loops of the slightly distended small bowel were agglutinated by a thick, fibrinopurulent exudate, which when separated exposed loculated areas of creamy pus between the folds of the mesentery. The retroperitoneal tissue was very edematous. Sectioned surfaces of the mesenteric tumor displayed a pale gray, uniformly granular composition which was fairly firm except where it was softened by areas of hemorrhagic degeneration. The right pleural cavity was completely obliterated by old fibrous adhesions.

The thyroid gland weighed 32 grams. The upper pole of the right lobe contained an encapsulated fetal adenoma, 12 mm. in diameter. The slightly enlarged heart weighed 410 grams. The usual amount of subepicardial fat tissue was present and the epicardium and endocardium were intact. The foramen ovale was open. The soft, light brown myocardium contained no gross scarring. The coronary vessels exhibited grade II atherosclerosis without calcification or stenosis. The aorta and its major branches were involved only slightly by atherosclerosis.

Each lung weighed 510 grams. Except for edema and congestion they exhibited no significant changes. The right peribronchial lymph nodes were moist, black, and enlarged. The largest was 2.5 by 2 by 1 cm. Its sectioned surfaces were pale gray. The regional lymph nodes

exhibited no gross noteworthy features. The pale yellow-brown liver weighed 1,970 grams. The gallbladder and extrahepatic biliary passages were normal. The hepatic lymph nodes were moderately enlarged.

The large spleen weighed 620 grams. Its capsule was slightly thickened. Multiple sectioned surfaces revealed a fairly firm, pale gray-red pulp in which were distributed myriads of gray nodules with irregular borders, varying from 3 to 8 mm. in diameter. The pancreas only weighed 55 grams and revealed no gross noteworthy features. However, numerous enlarged lymph nodes surrounded the head. The esophagus was normal and the stomach was practically empty. Arising from the ventral wall near the lesser curvature of the gastric cardia was an oval, semifirm, polypoid tumor mass, 3.5 by 2 by 2.5 cm., covered by a black-stained, glistening mucosa. Large, prominent, hyperplastic rugae were present in the prepyloric and pyloric regions of the stomach. Most of the pale gray gastric mucosa was covered by viscid, black, mucoid material. The first portion of the duodenum also contained semi-soft, elevated, polypoid masses of neoplastic tissue covered by intact mucosa. Similar infiltrations were present in the terminal 10 cm. of the ileum, the cecum, lower portion of the sigmoid colon, and the rectum. The ileocecal valve was slightly thickened but covered by a moist, intact mucosa. The mucosal masses in the rectum measured up to 10 mm. The vermiform appendix was swollen to the size of a little finger. Its thick wall was pale gray.

The right adrenal gland weighed 10 grams and the left, 12 grams. Except for a cortical adenoma of the left gland, these organs were normal. Each kidney weighed 140 grams. The slightly thickened, adherent capsule covered a finely granular, pale gray to yellow surface irregularly pitted by shallow depressions. Sectioned surfaces everted slightly and the corticomedullary differentiation was not distinct. Except for a few pinhead-sized hemorrhages in the mucosa of the renal pelvis, no gross significant changes were noted. The urinary bladder and prostate gland were grossly normal. The medullary cavity of the left femur in its upper one-third contained soft, raspberry red marrow.

The pertinent microscopic findings of the right peribronchial, hepatic, and peripancreatic lymph nodes, mesenteric tumor mass, spleen, and polypoid masses of the gastrointestinal tract consisted of an extensive malignant neoplasia of the reticular cells in intimate relation with reticular (argyrophil) fibers. Most of the large lymph nodes had lost their normal architecture because of the diffuse cellular overgrowth. Similar changes were noted in the spleen. The walls of the stomach and intestine were extensively pervaded. The polypoid masses projecting into the lumen were also composed of reticular cells causing complete obliteration of the mucosa in many places. The tissue was very vascular. The hyperplastic femoral bone marrow contained islands of proliferating reticular cells and reticular fibers.

The anatomic diagnosis was: Reticulum cell lymphosarcoma of the gastrointestinal tract, right peribronchial and abdominal lymph nodes, spleen, and bone marrow; fibrinopurulent peritonitis (Clos. welchii and Esch. coli); recent, infected laparotomy wound; double barrel ileostomy; cloudy swelling of the liver and kidneys; moderate cardiac hypertrophy; cortical adenoma of the left adrenal gland; pulmonary edema and congestion; fibrous obliteration of the left pleural cavity; icterus levis; surgical scar of the left mammary region; patent foramen ovale.

DISCUSSION

The rectal biopsy taken by Doctor Nesselrod revealed vascularized granulation tissue. Although the tonsil, subcutaneous tissue of the left mammary region, some of the lymph nodes of the mediastinum and abdomen were involved, the most dramatic manifestations of the disease occurred in the gastrointestinal tract and the symptoms produced there predominated the history of the disease. The widespread neoplastic pervasion of the wall of the ileum caused an ischemic necrosis in one area sufficient to cause perforation, peritonitis, and death.

Although this type of tumor usually decreases in size with adequate x-ray therapy, the remission eventually is followed by recurrence and a fatal termination.

Preacher: "Now, class, what is false doctrine?"
Andrew: "I know, bad medicine."

Patient: "Doctor, I am worried and afraid. This is my fifth operation."

Doctor: "Your fifth? What are you worrying about? It is my first."

News of the State

PERSONALS · COMING EVENTS · MARRIAGES · DEATHS

COMING MEETINGS

March 10 — Bureau County Medical Society — Spring Valley, St. Margaret's Hospital — dinner 6:30 — Lindon Seed — "Goiter."

March 10 — Effingham County — Effingham, Benwood Hotel — 7:30 P.M. E. Lee Dorsett of St. Louis — "Treatment of Pre-Eclamptic Toxemia and Eclampsia."

March 12 — Union County Medical Society — 6:30 — Anna — W. J. Morginson — "Pre-Cancerous and Cancerous Skin Lesions."

March 13 — Jersey-Greene County Medical Society — Carrolton — 6:30 — W. C. Scrivner — "Cancer."

March 13 — Will-Grundy County Medical Society — Louis Joliet Hotel, Joliet — 12:00 noon — Frederick H. Falls — "Diagnosis of Early Carcinoma of the Uterus.

March 17 — Knox County Medical Society — Galesburg Club, Galesburg. 6:00 P.M. — Charles Edwin Galloway, "Anesthetics in Obstetrics" and H. Close Hesseltine, "Citamins in Obstetrics and Gynecology."

March 20 — Will-Grundy County Medical Society — Louis Joliet Hotel, Joliet — 12:00 noon — Paul C. Bucy, "Physiology of the Nervous System."

March 27 — Will-Grundy County Medical Society — Louis Joliet Hotel, Joliet — 12:00 noon — R. T. Pettit, "Cancer of the Stomach, Surgery Plus Radiation."

April 7 — Bureau County Medical Society — St. Margaret's Hospital, Spring Valley — 6:30 P.M. — Eugene Cary, "Management of Occiput Posterior."

CLINICAL CONFERENCE DAY

Belleville, Illinois

April 9

The Post-Graduate Committees of the Illinois and Missouri State Medical Societies are sponsoring for the first time a joint clinical conference day for the doctors of Illinois and Missouri on APRIL 9th, Belleville, Illinois.

The following program has been tentatively arranged to appeal to doctors in all fields of work:

9:00- 9:25 A.M.—"Five Day Treatment of Syphilis" — speaker from Missouri

9:30- 9:55 A.M.—"Fractures, handling of accident cases" — Carlo S. Scuderi, M.D. — Chicago

10:00-10:25 A.M.—"Urology — diagnosis and significance of Hematuria" — Missouri speaker.

10:30-10:55 A.M.—"Endocrinology" — James H. Hutton, M.D. — Chicago

11:00-11:25 A.M.—"Geriatrics" — speaker from Missouri

11:30-12:00 A.M.—Round tables led by above speakers

12:30- 1:30 P.M.—Luncheon

G. C. Otrich, M.D., Councilor of the 10th District will preside.

Hugh Neilson, M.D., Chairman of the Missouri State Medical Society Post Graduate Committee, will speak on "Post-Graduate Education in Missouri." He will introduce the President and Secretary of the Missouri State Medical Society.

1:30- 2:30 P.M.—HEART FORUM — conducted by Robert S. Berghoff, M.D., Chairman Illinois State Medical Society Post-Graduate Education Committee — as-

sisted by two specialists from Illinois and Missouri.

Doctors attending the conference will be asked to deposit in a special box before the luncheon, questions which they wish to have discussed and answered by the clinicians.

2:30- 2:55 P.M.—"General Medicine" — speaker from Missouri

3:00- 3:25 P.M.—"The Role of Fluid Balance in Pediatrics" — Walter M. Whitaker, M.D. — Quincy, Illinois

3:30- 4:00 P.M.—"urgery of the Chest" — speaker from Missouri

4:00- 4:30 P.M.—"Psychiatry — Recognition of the Psychopathic State in the Selectee" — speaker from Illinois

4:30- 5:00 P.M.—ROUND TABLES led by above speakers

5:00- 6:00 P.M.—Social Hour

6:30 P.M.—Dinner — G. C. Otrich, M.D. will preside. Robert S. Berghoff, M.D. will introduce the President and Secretary of the Illinois State Medical Society and it is hoped the Governors of Missouri and Illinois.

8:00 P.M.—Speaker on some phase of War Medicine.

Official announcements will be sent to all doctors in southern Illinois and the St. Louis area of Missouri who in the meantime are asked to reserve this date of April 9th at Belleville.

Dr. J. P. Greenhill addressed the Obstetrical Society of Boston February 17th on the subject "The Use and Potency of Synthetic Estrogens." On February 18th he read a paper before the Buffalo Academy of Medicine on "The Essentials of Office Gynecology."

At the annual meeting of the Chicago Dermatological Society held January 21, 1942, the following officers were elected for the ensuing year: President, Dr. Udo J. Wile of Ann Arbor, Michigan; Vice-President, Dr. Marcus R. Caro of Chicago and Secretary-Treasurer, Dr. Michael H. Ebert of Chicago.

The Second American Congress on Obstetrics and Gynecology will be held in St. Louis, April 6-10. Leading gynecologists, obstetricians, nurses, hospital administrators, public health officials and medical educators are participating in the program. The material presented is designed to reach not only specialists but general practitioners, nurses and all those others interested in maternal care and the reduction of mortality and morbidity among mothers and newborn babies. Further information concerning the program may be secured by writing the office of the Congress at 650 Rush Street, Chicago.

DEATHS.

JUSTUS CORBLY GARARD, Chicago; University of Illinois College of Medicine, 1905; member of the staff of St. Anne's Hospital for many years; died February 4, 1942, age 68 years.

JAMES F. CHVATAL, Chicago; Rush Medical College, 1893; died January 27, 1942, age 76.

WILLIAM DICK CUTTER, Chicago; Johns Hopkins University School of Medicine, 1905; Secretary of the American Medical Association Council on Medical Education and Hospitals; died January 22, 1942, age 63 years.

LEON GROTOWSKI, Chicago; Chicago College of Medicine and Surgery, 1913; died February 4, 1942, aged 63.

CAROLYN N. MACDONALD, Chicago, Rush Medical College, a member of the staff of the Women's and Children's hospital and instructor in urology at Northwestern University Medical School. She was a past president of the Chicago Council of Medical Women and a member of the Chicago Zonta Club. She died in St. Luke's Hospital, February 20, 1942, age 54 years.

HARRY LEWIS POLLOCK, Chicago; University of Illinois College of Medicine, 1894; formerly otolaryngologist at North Chicago Hospital, recently head of that department at the American Hospital; died January 24, 1942, age 67 years.

ALBERT SCHUPMANN, Chicago; Homeopathic Medical College of Missouri, 1897; member of the Staffs of Alexian Brothers and North Shore Hospitals; died January 25, 1942, age 79 years.

CHARLES LORTON BEST, Freeport; Rush Medical College, 1904; Dr. Best spent 18 months in surgery at the University of Vienna, returning to Freeport to enter practice in 1907. He was a fellow of the American College of Surgeons, chief of staff at St. Francis Hospital, Freeport, and chairman of the board of the Stephenson County Tuberculosis Association. For the

past eight years he was division surgeon for the Illinois Central railroad. He was a past president of the Freeport Rotary Club, a Mason, and a member of the Freeport Country Club and of the Elks. He died from a heart attack February 6, 1942, aged 62 years.

GUSTAVUS G. BOCK, Smithton; Washington University School of Medicine, St. Louis, 1882; for 27 years he had been mayor of Smithton; died February 6, 1942, page 83.

JOHN T. FINLEY, Prairie du Rocher; Eclectic Medical College, Cincinnati, 1927; mayor of Prairie du Rocher; died of a heart attack January 25, 1942; age 45 years.

JOHN HALPIN, Springfield, formerly of Pittsfield; Washington University School of Medicine, 1883; died January 19, 1942.

LEMUEL B. RUSSELL, Hoopeston; Rush Medical College, 1894; member of the Masonic lodge and of the Modern Woodmen; died January 23, 1942.

HERMAN S. PEFOON, Chicago; Hahnemann Medical College and Hospital, 1889; for many years a teacher of botany at the Lake View High School; aged 81; died Dec. 26, 1941, in the Augustana Hospital of carcinoma of the prostate.

JOSEPH K. CIESLA, Chicago; member of the medical staff of St. Marys' of Nazareth Hospital, died February 18, 1942.

FRED BELZIG, Chicago; Chicago College of Medicine and Surgery, 1914; died February 16, 1942.

HARDY MAXEY SWIFT, Mt. Vernon; Physio-Medical College of Indiana, 1895; was Mt. Vernon mayor for three terms and twice a member of the Illinois state legislature; died February 15, 1942, at Mt. Vernon Hospital of injuries received in an automobile accident. He was 71 years old.

FRANK HULBURT BOOTH, Chicago; Rush Medical College, Chicago, 1885; aged 81; died, Dec. 6, 1941, in the Research and Educational Hospital of carcinoma of the bladder.

The Indication for Gross Iron Therapy.—Under normal circumstances the body is able to replenish a depleted iron store from dietary sources alone but at a relatively slow rate. Approximately 25 milligrams of absorbed iron is required to synthesize enough hemoglobin to raise the level one per cent. When one considers that only about 5 milligrams daily are absorbed from an adequate food intake, simple calculation would indicate that some fifty days would elapse before a rise of ten per cent in hemoglobin level could be expected. When by common experience this absorption rate is accelerated ten or fifteen times by the addition of an excess of inorganic iron to the diet, the indication for gross iron therapy becomes obvious.—Philip F. Eckman, M.D.: Indications for Use of Iron in Treatment of the Anemias, Minnesota Medicine, 23:714 (October) 1940.

METAL-FINDER

On May 16 a speaker on the German radio described a new device by which, he claimed, bullets, shell splinters, needles and other metal objects can be readily located. This metal-finder, developed by the firm of Siemens and their medical advisers, depends on the use of a high-frequency oscillator of small intensity. The tuning coil of a small short-wave transmitter is fitted into a sterilisable porcelain probe, 10 cm. long and 10 mm. in diameter; if this coil approaches a metallic substance — such as a splinter in the operation area — the inductance of the coil will change, and hence so will the frequency of the transmitter. The change of frequency, which may be very minute, can be made audible by combining these oscillations with those of a second short-wave transmitter oscillating at a slightly different frequency, and so obtaining oscillations at the beat frequency, amplifying them and passing them to a loud-speaker. The apparatus has an equally good reaction to all metals, including the large group of light metals now being increasingly used which cannot be located by magnetism. It is also extremely sensitive and can trace the minutest particles. Tests carried out during more than a hundred operations have proved its worth, and so far it has never failed, even in such delicate cases as the localisation of a sewing needle in the lungs or a splinter the size of a pin's head in the knee-joint. On the contrary "such difficult operations can only be attempted with the hope of certain success," said the broadcaster, "with the aid of the metal-finder." The apparatus is so sensitive that all metal instruments within a 10 cm. radius must be removed while the probe is in use; porcelain towel-clips have therefore been introduced and have proved satisfactory. The Germans are hoping to begin distribution of the apparatus to hospitals and field hospitals within the next few months.—*The Lancet, May 31, 1941.*

When novocaine first came into use, a local dentist in a nearby town tried it out as an experiment. He injected the drug in the jaw of his patient, an elderly man, and then asked him how he felt. There was no answer. The dentist waited a minute and asked, "How do you feel now?" Still no answer. Nervous, the dentist grabbed a glass of ice water and threw it in the patient's face to revive him. The man jumped up and yelled, "Good Heavens, what ails you? I'm all right. I'm just hard of hearing."

Doctor making ward rounds: "Gentlemen, notice the enormous chest on this man." To the patient, "Do you play a wind instrument?"

Patient: "Yes, I do."

Doctor: "Ah, I was sure of it. Prolonged blowing on a wind instrument is always responsible for such chest development. What instrument do you play?"

Patient: "The accordion, sir."

radio de-
ed, bullets,
ects can be
ped by the
rs, depends
f small in-
vave trans-
probe, 10
s coil ap-
splinter in
e coil will
the trans-
ay be very
hese oscil-
ransmitter
y, and so
amplify-
ker. The
all metals,
ow being
y magne-
trace the
ng more
orth, and
ate cases
lungs or
nee-joint.
can only
ss," said
l-finder."
l instru-
ed while
e there-
sfactory.
n of the
thin the

al den-
eriment.
ent, an
There
te and
answer.
er and
ne man
's you?

notice
patient,

blow-
le for
o you